

Dealers Drive for Factory Aid

Pressure Grows More Intense For Code Help and Bargaining

by Don Blanchard

Editor, Automotive Industries



Jo G. Roberts

New NRA deputy administrator in charge of automotive codes. See page 129

Proposals that car factories cooperate in the enforcement of the new car price maintenance and used car allowance provisions of the motor vehicle retailing code are gaining wider and wider support among dealers. Along with these proposals there is a growing sentiment in the trade favorable to using the newly won organization strength of the National Automobile Dealers Association in collective bargaining with the factories not only to secure help on the code but also on factory-dealer relationships. Among a few of the more radically inclined, in fact, there is some talk of a dealers' strike if collective bargaining fails to give the desired results, or if the factories refuse to negotiate.

The latest evidence of trade thought along these lines is a vigorous resolution adopted unanimously by the Automotive Trade Association Managers at their summer convention held last week in Atlantic City. This resolution reads as follows:

"Believing that support can be obtained from the motor car manufacturers which will make effective the fair trade provisions of the Motor Vehicle Retailing Trade Code and perpetuate same to the great benefit of the motor vehicle trade, the manufacturer as well as the retailer, we ask in behalf of the organizations we represent that steps be taken immediately by the National Automobile Dealers Association to obtain this support.

"We feel that a man, or men, of unquestioned ability, integrity and understanding of the problems of the industry must be employed to negotiate with the factories for the adoption of a plan which would attain the

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N. Y. Court Gives Code Violator \$500 or 3 Mos.

NEW YORK—Gordon S. Harris was found guilty in the Court of Special Sessions on Wednesday of this week of selling a new car for \$50 less than the authorized price in violation of the Shackno Act, New York's NRA law. This was the first conviction under the Act in the city and the court fined the defendant \$500 with the alternative of three months in the workhouse.

Estimate 225,000 August Production; To Keep Output Deliveries Balanced

by Athel F. Denham

Detroit Editor, Automotive Industries

DETROIT—With July production expected to show a total for cars and trucks of roughly 270,000 when all reports are in from scattered assembly plants, August schedules represent a decline of about 20 per cent for a total of 225,000 cars and trucks. This estimate is slightly below the total for August of

last year when 240,000 units were produced, but is an excellent showing considering the high production rates current the first seven months of the year.

July retail domestic deliveries on passenger cars and trucks held up remarkably well, strengthening in the final

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Pattern Makers Threaten New Tool and Die Tie-Up

DETROIT—Some 600 pattern makers walked out of Detroit tool and die job shops Wednesday morning following refusals of the shops to accede to a request for a 20 per cent increase in wages according to the Pattern Makers Local of American Federation of Labor. Pattern makers in plants of automobile manufacturers have not as yet been called out but the Federation Local is authority for the statement that they will be called out before the end of the week.

The Pattern Makers Association claims a membership of some 1800 in Detroit and claims it will call all at present employed out on strike. If the demand for 20 per cent increase in wages is successful a further demand for a thirty-hour week will be made, according to an association official.

Managers Would Hold Local Show Displays For Entire Exhibition

ATLANTIC CITY — The policy of holding all displays in local shows until the close of the exhibitions was reaffirmed by unanimous resolution of the annual convention of the International Association of Automobile Show and Association Managers held here last week. Copies of the resolution, which is designed to prevent removal of exhibits early in order to get to the next show on the circuit on opening day, will be sent to all car factory sales managers.

The convention also considered a proposal to arrange the local shows into four groups, the dates of the shows in each group to follow in an order that would minimize shipment of special factory exhibits. The plan was offered with the thought that by its adoption the factories would have to build only four sets of exhibits in order to cover the important local shows. The consensus, however, was that at least eight sets of displays would be necessary since there is a strong tendency among the local show managers to stage their shows in one of the four weeks between the opening day of the New York Show and the closing of the Chicago exhibition. The managers feel that if the shows are held much later than this, attendance will suffer because of the fact that the newness has begun to wear off the new models introduced at New York. They also believe late show dates tend to slow up buying after the first of the year.

A new name for the organization—Automotive Trade Association Managers—was adopted. Robert E. Lee, formerly manager of the St. Louis Association and now ill at Sarasota, Fla., was reelected president, as was also Herbert Buckman, Cleveland, as vice-president. W. P. Berrien, Philadelphia, was elected secretary-treasurer, succeeding Leon F. Bannigan, editor of *Automobile Trade Journal*. John E. Raine, Baltimore, and H. H. Shuart, Detroit, were elected directors.

Among the speakers at the meeting were Alfred Reeves, vice-president of the N.A.C.C.; John Munn of the N.A.D.A.; Al Laansma of the M.E.M.A., and Jo G. Roberts, newly appointed NRA deputy administrator in charge of automotive codes.

Brake Lining Sales Up 31% In 6 Months

NEW YORK—Sales of brake linings and clutch facings for the first six months of this year were 31 per cent ahead of the same period last year, according to figures issued by the Brake Lining Manufacturers Association.

Because of the large increase in automobile production, the sales for new equipment increased 66 per cent. Export sales were up 30 per cent, running ahead of replacement sales in the United States.

Replacement sales were up 14 per cent for the period, due largely to a 17 per cent increase in sales of standard brand materials. Sales to chain stores and mail order houses were 9 per cent below the same period last year and 33 1/3 per cent lower than the last six months of 1933.

The total sales for the six months' period by the industry were \$9,380,000 compared with \$7,132,000 for the first half of last year.

Fords Vacationing at Huron Mountain Club

MARQUETTE—Mr. and Mrs. Henry Ford have gone to the Huron Mountain Club, fronting on Lake Superior, for a vacation.

Mr. Ford observed his seventy-first birthday Monday. His only departure from the "business-as-usual" program was the fact that he is in the north woods. He and Mrs. Ford had their customary dinner together without guests.

Caroline R. Bement

LANSING — Mrs. Caroline Roberts Bement, wife of Clarence E. Bement, chairman of the board of the Novo Engine Co., died at her home here last week. Mrs. Bement's death followed a protracted illness.



Miss Mary Wonderer, of the Detroit zone office, Pontiac Motor Company, low gross winner of the first annual golf tournament of the General Motors Girls' Club held at Washtenaw Country Club, Ypsilanti. More than 150 women employed in General Motors offices in Detroit participated in the tournament

Paul W. Abbott

SOUTH BEND—Funeral services were held last week for Paul W. Abbott who died in the Epworth Hospital following a long illness. Mr. Abbott was supervisor of inspection at the Studebaker plants from 1921 to 1931. Previous to that time he held various positions at the Cadillac and Lincoln plants in Detroit. During the past three years Mr. Abbott has been associated with Paul Bard as a manufacturers' representative in South Bend.

First Half New Truck Registrations More Than Double Same Period of '33

	June, 1934	June, 1933	6 Mos., 1934	6 Mos., 1933
Chevrolet	12,961	10,191	76,926	40,417
Ford	12,205	6,080	61,503	24,257
Dodge	3,729	1,936	21,995	5,335
I. H. C.	2,435	2,482	15,288	10,276
G. M. C.	884	583	4,479	2,807
Diamond T.	481	363	2,850	1,681
Reo	504	278	2,698	1,204
White	404	117	2,292	727
Mack	154	149	1,022	634
Federal	196	99	971	504
Studebaker	133	184	782	956
Brockway	108	66	618	383
Autocar	95	113	530	428
Stewart	67	65	448	267
Austin	22	104	372	509
Indiana	43	102	350	552
All Others	337	342	1,630	1,893
Total	34,778	23,254	194,714	92,830

Dollar Volume Gain In First Half Leads Unit Production Increase

NEW YORK—Analysis of the passenger car production figures in the first half of this year and comparison with data for the similar period last year, indicates that the increase in the industry's dollar volume was substantially more than the gain in unit production.

The \$501-\$750 and \$751-\$1,000 wholesale price classes show gains respectively of 257 and 146.5 per cent, as compared with an increase of 69.1 per cent in total production. The under \$500 group registered an increase of but 33.9 per cent, while the \$1,001-\$1,500 group showed a better average gain of 74 per cent. The improvement registered by the three classes between \$501 and \$1,500, of course, was due in part to somewhat higher prices but the magnitude of the gains indicates beyond question that the medium-priced cars—particularly these

in the low-medium priced bracket—staged an impressive comeback. This broadening of the market means more than an increase in the industry's dollar volume since it reveals that the benefits of recovery are being somewhat more broadly distributed than was the case last year.

The table below gives a detailed analysis of passenger car production by price classes in the first six months and also of truck production by capacities:

Adv. Agency Moves

DETROIT—The Detroit offices of J. Stirling Getchell have recently been moved to 605 New Center Building, from the former location in the Stormfeltz-Loveley Building.

First Six Months

	1934	1933	Per Cent Change	1934	1933
\$500 and under.....	938,352	699,596	+33.9	63.9	80.6
\$501-\$750	499,920	126,165	+257.0	30.6	14.5
\$751-\$1,000	47,749	19,263	+146.5	3.3	2.2
\$1,001-\$1,500	20,643	11,856	+74.0	1.4	1.4
\$1,501-\$2,000	5,205	5,751	-9.5	0.4	0.7
\$2,001-\$3,000	4,469	4,592	-2.6	0.3	0.5
\$3,001 and over.....	1,450	1,069	+35.7	0.1	0.1
Total	1,467,788	868,292	+69.1	100.0	100.0

Truck Production by Capacities

First Six Months 1934 and 1933 Compared

	1934	1933	Per Cent Change	1934	1933
1½ tons and less.....	303,457	148,697	+104.0	92.3	92.8
2-3 tons	21,294	9,396	+126.5	6.5	5.9
3½ tons and over.....	2,817	1,384	+103.0	0.9	0.9
Special and buses.....	1,053	607	+72.9	0.3	0.4
Total	328,621	160,084	+105.5	100.0	100.0

Labor Turn-Over Cut in 2nd Quarter

Automobile Industry Has Highest Quit, Discharge Rate in U.S. Report Shows

WASHINGTON—The net labor turn-over in the automobile industry for the second quarter of this year, ending June 30, was 9.03, based upon number of changes per 100 employees that took place during the quarter, according to a statistical review made by the U. S. Department of Labor. This figure compares with 15.97 for the first quarter of 1934 and 20.62 for the second quarter of 1933.

The automobile industry showed the highest quit rate and also the highest discharge rate of any industry reporting to the department for the quarter.

Quarterly Turn-Over Rates in the Automotive Industry

Class of Rates	2nd Quarter '33	1st Quarter '34	2nd Quarter '34
Quit	2.49	6.03	6.91
Discharge .....	.97	1.34	1.59
Lay-off	5.57	8.60	25.83
Total Separation	9.03	15.97	34.33
Accession	29.52	56.79	20.62
Net turn-over.....	9.03	15.97	20.62

Service Show Space Drawing, Sept. 14

CLEVELAND—The space drawing for the Automotive Service Industries Show will be held in the Hollenden Hotel, Cleveland, Friday, Sept. 14. From applications already in the hands of Show Manager A. B. Coffman, it appears that the 165,000 square feet of the New Exposition Hall of the Cleveland Public Auditorium will be insufficient to take care of the requirements of exhibitors.

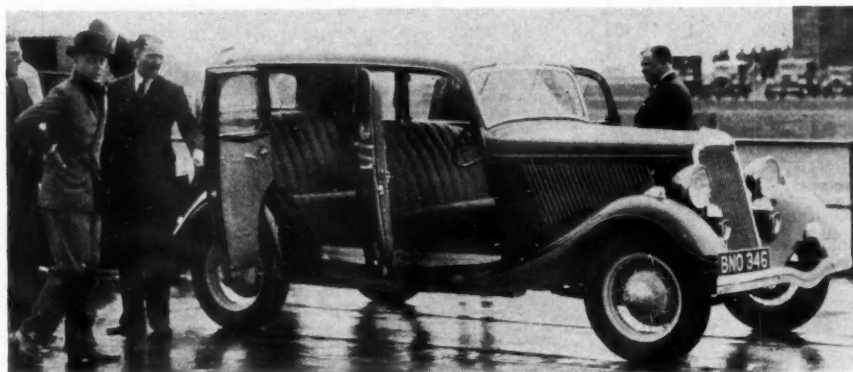
The show itself is scheduled for Nov. 19-23 in Cleveland, under the sponsorship of the Motor and Equipment Manufacturers Association, Motor and Equipment Wholesalers Association and the National Standard Parts Association.

Ford Leads Michigan New Car Registration

DETROIT—New car registrations in Michigan during June amounted to 16,934, compared with 16,210 in May, and 12,491 in June, 1933.

Ford, with 6796, showed a decline of 7 per cent from the May total, while Chevrolet totaling 4289, was up 21 per cent over the previous month. Plymouth registered 1798 for an increase of 14 per cent over May.

Other makes showing increases over the previous month were: Buick, Dodge, Lafayette, Oldsmobile, Packard, Pontiac and Studebaker.



Wales Visits Ford Plant

Heir to the British throne visited the 500-acre plant of the Ford Motor Co. at Dagenham, England. The Prince is shown on his arrival at the factory

NRA Re-Classifies Maintenance Trade

Now Under Automotive Section; To Have Own Deputy Administrator

WASHINGTON—Transferred from the trade service classification to the automotive section of Division I of the NRA, codification of the automotive maintenance trade is in process and plans are being made to select an assistant deputy to handle it exclusively because of its wide ramifications.

It is hoped that when the maintenance code is completed it will be possible to determine what organizations will have a right to come under it. The work of classification promises to be difficult and to require considerable study and in order that this may be done it will be necessary to select a man who is thoroughly acquainted with the trade and its various elements. The work once done, however, it is expected that organizations which have been placed under trade service classification will again come under the regular NRA code. The automotive maintenance trade itself recently was taken out of the latter classification and placed under the trade service branch which simply involves regional agreement with NRA maintaining jurisdiction over alleged violation of trade practices. Restoration of the maintenance code to the automotive division means that it will

incorporate trade practice provisions.

The International Garage Assn., which sponsored the parking and storage code whose trade practice sections were cancelled when it was classed as a service trade, has been merged with the National Automotive Maintenance Association.

Hexcel Radiator Moves To Racine About Jan. 1

MILWAUKEE—The Hexcel Radiator Co., Milwaukee manufacturer of automobile, truck and tractor radiators, hot water heaters for automobiles, space heaters, etc., has purchased a large building of the former Ajax Rubber Co. group in Racine, Wis., at foreclosure sale, and after reconditioning it will move from Milwaukee about Jan. 1, when the lease on the present quarters at 277 Erie Street expires.

The Racine factory originally was built by Fred M. Opitz, president of the Hexcel company, in 1920 at a cost of nearly \$100,000, and sold by him to Ajax when that concern was in process of expansion several years later. It is situated on the right-of-way of the Milwaukee Road near Taylor Avenue.

Ralph Evinrude Succeeds Father

MILWAUKEE—Ralph S. Evinrude has been elected president of the Outboard Motors Corp., Milwaukee, to fill the vacancy caused by the death of his father, Ole Evinrude.

Steel Mills Depend On Automotive Orders

Operations Drop To 35% of Capacities; Revival Expected in Late August

NEW YORK—Specifications emanating from automotive consumers made it possible for finishing mills in the Pittsburgh, Youngstown and Cleveland districts to maintain this week a rate of operations ranging from 25 to 35 per cent of capacity while mills in the Detroit area were holding their own with better than double that rate. A slight recession was noted in the Chicago district. It is freely conceded that automotive orders and nothing else keep the wheels turning at this time.

In lines in which automotive takings are not so impressive as in flat steels, for instance in steel bars, there is a disposition to minimize the part played by automotive releases in the current movement, but the latter continue to form the backbone of activity of alloy steel specialists.

A slight change in Ford sheet specifications is interpreted in steel circles as forecasting a change in 1935 models, thought to be conservative rather than radical. Both sheet and strip mills count on a marked revival in demand for their products late this month and during the first half of September when the need of material for new models' production should make itself felt.

The American Iron and Steel Institute's report of mill operations this week shows a decline of 5.7 per cent from last week's rate, being placed at 23 per cent of capacity, less than half the rate reported in the forepart of June. Finishing mills, however, are working at a better rate than primary plants. For the time being very little is said by buyers on the subject of price. They continue to order a week or two ahead of when and what they actually need, apparently being satisfied to shelve price discussions until developments in the Fall permit of a clearer picture of the country's economic trend. Meanwhile, however, prevailing conditions make it vividly clear to steel producers that more often than not the rate at which they can operate their mills depends entirely on the support of their automotive customers.

Pig Iron—In nearly all the pig iron distributing markets a period of intensive midsummer dullness has set in. In New England competition by imported iron threatens to upset price stability in the market for domestic irons. No changes in filed prices are noted.

Aluminum—Quiet and unchanged. Quite a little scrap aluminum is being exported to Japan.

Copper—The Copper Code Authority is whipping into shape its methods of control, buying agreements and questionnaires for that purpose being sent to fabricators this week. Custom smelters have again asked for a readjustment of allocations. Both the "Blue Eagle" and "outside" markets are unchanged.

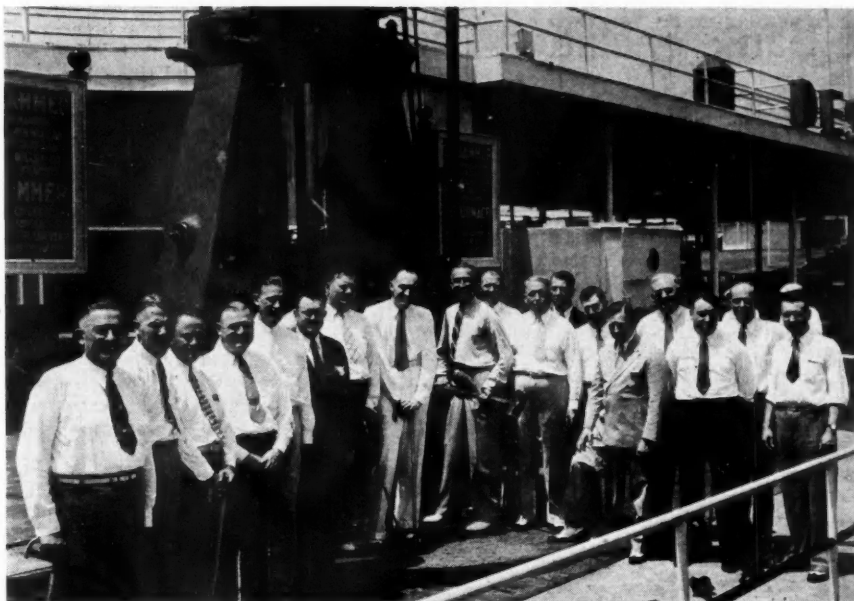
Zinc—Quiet and unchanged.

June Car Registrations Reverse Normal Seasonal Trend, Complete Reports Show

	June 1934	May 1934	6 Months 1934	6 Months 1933
Auburn	477	597	2,299	3,028
Austin	58	85	741	2,183
Buick	8,304	5,310	30,968	25,277
Cadillac	499	683	2,935	2,262
Chevrolet	64,525	57,793	268,646	230,498
Chrysler	3,226	3,713	13,052	12,637
Continental	23	45	892	753
De Soto	1,145	1,458	5,633	9,385
Dodge	9,216	9,058	49,404	33,800
Ford	64,333	67,993	295,114	131,943
Franklin	45	96	324	675
Graham	1,291	1,535	6,929	5,131
Hudson	1,995	2,705	10,978	1,779
Hupmobile	669	657	2,705	3,655
La Fayette	1,361	978	2,787	1,848
La Salle	761	963	2,759	1,848
Lincoln	173	225	1,059	1,182
Nash	1,342	1,738	8,413	5,726
Oldsmobile	9,180	9,330	34,329	17,768
Packard	581	516	2,805	4,749
Pierce-Arrow	193	211	934	900
Plymouth	34,080	33,280	158,915	99,592
Pontiac	9,025	9,238	41,700	43,181
Reo	465	519	1,897	1,586
Studebaker	5,226	4,140	22,891	17,310
Terraplane	4,659	5,451	22,665	15,583
Willys	772	825	3,183	8,912
Miscellaneous	18	21	164	1,138
Total	223,642	219,163	995,121	682,481

August 4, 1934

Automotive Industries



DE SOTO SALES CHIEFS VISIT FAIR

Headed by Roy Peed (center, holding sledge hammer), general sales manager, DeSoto district managers from all quarters of the country visited the Chrysler Motors exhibit; the giant forge hammer caught their fancy as they saw it deliver a wallop of 15,000 tons

GM's Foremen Study Industrial Relations

5000 Receive Special Training in Technical Work, Social Sciences

DETROIT—More than 5,000 foremen in manufacturing plants of the General Motors Corporation have taken special training in the past few months to learn the science of industrial relations, especially as it pertains to closer cooperation with their men.

These foremen, regarded as key men in correcting industrial misunderstandings, have returned to their posts with a deeper appreciation of the guiding impulses of human behavior on one hand, and broad phases of industrial economics on the other. The instruction is intended to define the position of the foremen under collective bargaining rights that employees now have with management as well as to make foremanship more responsive in relaying ideas up or down through plant organization.

The courses originating in the General Motors Institute at Flint, Mich., were first conceived seven years ago, but the current training is far more extensive and widely attended than any previously offered. Instruction continues several weeks.

Major Albert Sobey, director of the institute, who heads a highly-trained faculty giving foremanship training in addition to many other technical courses, states that the rapid development of employee associations makes such specialized foremanship training imperative. Foremen who are conveniently

near Flint attend the conferences at the institute. In remote centers, faculty members visit the plants and lead the foremen conferences. In some cases, these conferences are led by members of the plant organization who have received special training at the institute. All sessions are limited to 25 men, so that personal questions and problems can be analyzed. Standardized text sheets written especially for this study are used. General discussion helps to clarify perplexing situations presented during every conference.

Specifically, the aims and operation of employee representation are analyzed from the viewpoints of the worker; differences in individual desires and incentives are studied. Ways and means to reach a better understanding are discussed to insure improved supervision policies. Cooperative methods, the judging of men, group morale, transmitting orders and other vital subjects receive special attention.

Six Months' Earnings

Vehicle Companies		1934	1933
7 Companies Reported	.....	+\$58,547,169	+\$39,524,714
Meteor Motor Car Co.	.....	4,344	10,761
Yellow Truck & Coach	.....	272,394	1,188,331
Federal Truck Co.	.....	37,097	182,707
Hupp Corp.	.....	1,479,367	742,526
Reo Co.	.....	506,944	762,156
Total—12 Companies	.....	+\$56,821,005	+\$36,638,233
Other Automotive Companies		1934	1933
16 Companies Reported	.....	+\$6,094,394	— \$1,034,049
Houdaille-Hershey Corp.	.....	725,808	32,637
Kelsey-Hayes Co.	.....	465,955	302,176
Noblitt-Sparks, Inc.	.....	140,632	25,707
United American Bosch Corp.	.....	131,324	34,915
Clark Equipment Co.	.....	216,532	148,551
Federal-Mogul	.....	85,151	9,321
Wilcox-Rich. Corp.	.....	343,298	131,650
Campbell, Wynant & Cannon	.....	72,274	18,588
Midland Steel	.....	293,651	278,896
Total—25 Companies	.....	+\$8,569,019	— \$1,088,166

Dodge Bros. Announce New 1½ Ton Chassis

131 in. and 136 in. List at \$490; 148 in., 161 in. Base is Priced at \$520

DETROIT—Dodge Brothers Corp. this week announces a new lower priced one and one-half ton chassis listing at \$490 for the 131-inch and 136-inch wheel bases. The 148- and 161-inch chassis carry a list price of \$520. Standard bodies are express, canopy screen and panel on the 131-inch chassis and platform and stake on the 136- and 161-inch chassis. The 148-inch chassis is furnished with cab only. These additional models carry virtually all the major features of the standard Dodge truck line.

Chicago U.S. Grand Jury Indicts Dealer

CHICAGO—A report comes from Lafayette Markle, manager of the Chicago Auto Trade Association, that the Uptown Motor Co., local Chevrolet dealer, was arraigned in the U. S. District Court here on July 27 on an indictment returned by the federal grand jury charging violation of the trade practice sections of the motor vehicle retailing trade. According to Mr. Markle, the indictment contained eight counts including charges of over-allowances, cutting delivered prices, etc., and the head of the company was released on \$2,500 bail pending trial.

This is believed to be the first federal indictment for violation of the trade practice sections of the dealer code.

Budd Gets Zephyr Order

PHILADELPHIA—The E. G. Budd Mfg. Co. has received an order for two more Zephyr trains from the Chicago, Burlington and Quincy Railroad. The trains will operate between Chicago and St. Paul and Minneapolis.

Extend Export-Import Bank Facilities To Include World-Wide Transactions

WASHINGTON — Current incoming and outgoing accounts of the United States will be definitely known by the Second Export-Import bank before making loans to assist American international trade. This statement was made by George N. Peek, president of the bank, in announcing that the bank's facilities have been extended to provide for expanded activities in granting credit.

"I believe in assisting our foreign trade, but I also believe in making sure that we get paid for it," said Mr. Peek in making known the policy of the board of trustees. The operations of this bank, originally announced as having principal reference to Cuba, are now extended to cover transactions with the world at large, with the exception of Russia. Financial aid for handling foreign trade with Russia is provided for by the First Export-Import bank but there have been no operations pending settlement of the debt owed the United States by Russia. Despite recognition of Russia, foreign trade with that country has shown hardly any expansion.

Operations of the Second Export-Import bank, Mr. Peek said, are provided for in short term, intermediate, and long term credit, which are respectively defined as less than 180 days, from 180 days to 12 months, and from one to five years. Since the bank expects to supplement, rather than to compete with existing sources of export and import credit, it points out in its formal statement of general policy, that short-term credit will be granted only when unusual circumstances

indicate that commercial banks cannot handle the business. Regarding intermediate credit—180 days to one year—the bank will endeavor to supplement any existing credit facilities on terms and conditions considered advisable for the specific credits proposed. With respect to long-term credit—one to five years—the bank will endeavor to offer facilities to the American exporters or importers on proposals which require financing over a period of not more than five years. A charge of $\frac{3}{4}$ per cent in excess of the rate (now 4 per cent) paid by the bank to the Reconstruction Finance Corp. will be made for intermediate term paper with full recourse on the applicant or acceptor. For long-term paper, the minimum charge will be 1 per cent in excess of such rate. Consumers' goods usually will be limited to intermediate credit; capital and producers' goods will be considered for either intermediate or long-term credit. Where export of agricultural surpluses is involved it is suggested that the Agricultural Adjustment Act should be utilized to facilitate the bank's operations.

Compliance with the Recovery Act is required of borrowers, and certificates to this end must be submitted.

While, as he has stated previously, the main purpose of the bank is to assist financing sellers in this country, Mr. Peek said that the bank will, however, supplement the activities of existing export and import credit facilities rather than compete with them. Opportunity will be given commercial banks and financial institutions to participate in special loans wherever they desire to do so.

It is not the intention to set up branches of the bank outside of Washington, but to deal with proposals directly and through regular banking channels.

"We have shaped our policy to accord with our conclusions from a comprehensive canvass of the situation during the past six months with American producers and business men, with whom we have carefully studied, case by case, their actual needs in relation to export and import business," said Mr. Peek. "We believe these new credit accommodations will be of decided value to American shippers, who will be able to bring employment and profit to the American people.

"In exceptional cases on fabricated articles we are proposing to share in the credit risk on a basis in no case exceeding 75 per cent of the total credit or the net delivered cost, whichever is lower; but we will consider each case separately. The cost will have to be borne by the firm thus underwritten. On non-fabricated articles underwritings will be treated on an individual basis."

A general advisory committee, representing agriculture, business and banking interests in different parts of the country, will be invited to advise the bank in its activities.

Under its form of incorporation, the bank is authorized "to do a general banking business . . . to purchase, sell and negotiate, with or without its endorsement, or guarantee, notes, drafts . . . and other evidences of indebtedness . . ." Any exporter or importer may apply directly or through any commercial bank for credit.

S.A.E. Office Closed

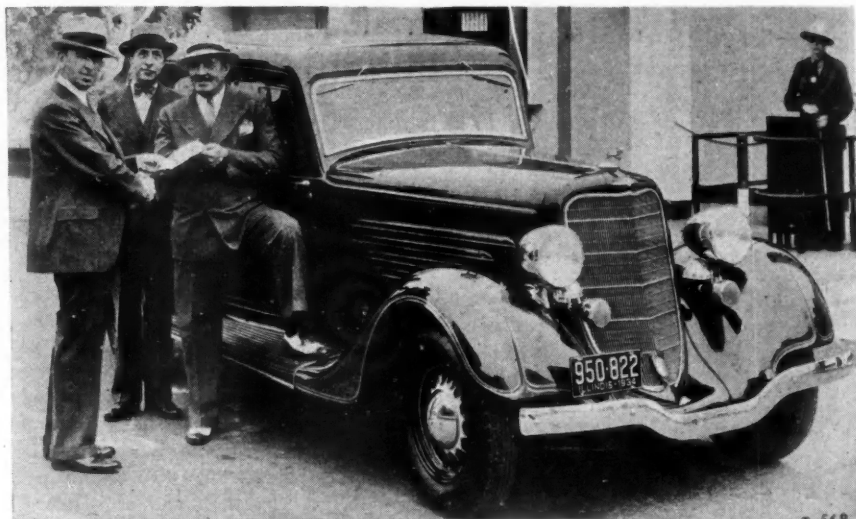
DETROIT—The Detroit office of S.A.E. is closed until Aug. 6 while Miss Beulah Brede, secretary, is on vacation.

Exports and Imports for the Automotive Industry for June and Six Months Ended June, 1934-33

	June 1934		June 1933		Six Months Ended June 1934		Six Months Ended June 1933	
	Number	Value	Number	Value	Number	Value	Number	Value
Automobiles, parts and accessories.....	.....	\$19,996,513	.....	\$6,943,898	.....	\$106,727,302	.....	\$41,559,369
Motor trucks, buses and chassis (total)....	6,816	3,596,742	2,478	1,234,717	49,872	23,182,549	16,325	7,260,590
Under one ton.....	587	214,226	283	103,054	4,891	1,545,825	1,870	539,338
One and up to 1½ tons.....	5,164	2,273,822	1,815	797,573	38,638	15,788,278	12,437	4,672,570
Over 1½ tons to 2½ tons.....	868	722,615	279	210,944	5,151	4,082,489	1,529	1,179,809
Over 2½ tons.....	157	350,374	64	114,647	496	1,647,429	372	783,936
PASSENGER CARS								
Passenger cars and chassis.....	17,970	9,939,682	4,757	2,423,143	79,235	43,450,751	33,620	16,252,757
Low price range \$850 inclusive.....	16,575	8,418,727	4,423	3,050,362	73,021	36,470,224	31,259	13,548,800
Medium price range over \$850 to \$1,200.....	1,014	996,143	196	189,713	4,032	3,901,109	1,382	1,334,661
\$1,200 to \$2,000.....	229	344,017	68	96,680	1,210	1,880,646	595	889,826
Over \$2,000.....	54	141,782	28	72,696	370	972,306	150	386,883
PARTS, etc.								
Parts except engines and tires.....	.....	3,502,983	.....	1,840,013	.....	23,905,960	.....	9,686,603
Automobile unit assemblies.....	.....	2,018,310	.....	900,022	.....	10,921,929	.....	5,315,001
Automobile parts for replacement (n.e.s.)....	.....	199,818	.....	127,148	.....	1,366,363	.....	684,050
Automobile accessories (n.e.s.).....	.....	277,867	.....	88,254	.....	1,190,993	.....	414,808
Automobile service appliances.....	.....	466,785	.....	283,490	.....	2,498,813	.....	2,696,251
Airplanes, seaplanes and other aircraft.....	23	192,625	22	113,886	146	1,378,725	199	870,472
Parts of airplanes, except engines and tires..	.....	.....	.....	.....	.....	.....	.....	.....
INTERNAL COMBUSTION ENGINES								
Stationary and Portable:	.....	.....	.....	.....	.....	.....	.....	.....
Diesel and semi-Diesel.....	5	6,668	1	9,521	53	116,014	11	39,579
Other stationary and portable:	.....	.....	.....	.....	.....	.....	.....	.....
Not over 10 hp.....	1,042	47,458	223	15,548	2,844	173,891	1,187	83,675
Over 10 hp.....	82	61,287	36	24,628	531	347,627	305	139,015
Automobile engines for:	.....	.....	.....	.....	.....	.....	.....	.....
Motor trucks and buses.....	439	48,803	84	13,500	2,725	330,765	998	139,639
Passenger cars.....	2,016	117,211	2,502	150,025	17,368	1,061,718	12,176	763,945
Aircraft.....	44	229,739	40	85,998	456	2,083,642	716	607,045
Accessories and parts (carburetors).....	.....	150,572	.....	88,171	.....	681,167	.....	474,456
IMPORTS								
Automobile and chassis (dutiable).....	29	11,306	44	50,948	223	78,429	226	115,330
Other vehicles and parts for them (dutiable)..	.....	8,357	.....	7,481	.....	43,686	.....	42,554

August 4, 1934

Automotive Industries



To Bring Him Back Alive

Frank Buck (right), noted hunter, purchases another Dodge for his next trip through the jungle. Mr. Buck is accepting delivery of the car from M. J. Lanahan (left), Chicago Dodge Dealer

District Committees to Hear Trade Complaints

WASHINGTON—Authorization to establish District Trade Practice Complaints Committees has been given to District Administrative Agencies by the National Code Authority of the Wholesale Automotive Trade. Failing to secure compliance, these district committees may refer the complaint to the NRA directors for their respective districts. The National Trade Practice Complaints Committee, however, must be notified not only of the original complaint but also of its reference to the State Director. In its discretion, the National Committee may decide that the complaint should go direct to the National Compliance Division of NRA instead of being handled by the State Director. Normally, of course, State Directors will confer with the National Compliance Division before referring the complaint to a Federal District Attorney for prosecution.

Borg-Warner Corp. Declares Dividend

CHICAGO—Directors of Borg-Warner Corp. have declared the regular quarterly dividend of \$1.75 per share on the preferred stock, and a dividend of 25 cents per share on the common stock. Both dividends are payable Oct. 1 to stockholders of record on Sept. 14.

Harry M. Stillman

DETROIT—Harry M. Stillman, 56 years old, died last week following a prolonged illness. He was an old-time automobile racer and recently was sales

engineer for Budd Wheel Co. He entered the automobile industry in 1903, being connected with the makers of Locomobile, Marmon and Oldsmobile. During his racing years, from 1904 to 1910, Mr. Stillman competed in and won the Vanderbilt Cup races on Long Island. He was a member of the Detroit Section S.A.E. Mr. Stillman is survived by his widow, a son, a daughter, and his father.

Dual-Ratio Axle for V-8's Announced by Columbia Co.

CLEVELAND, O.—A new dual-ratio axle for Ford V-8's has been announced by the Columbia Axle Co. which manufactures the dual-ratio axles for Auburn cars. This axle gives the Ford an overdrive ratio of 2.94 to 1, which is 28.5 per cent lower than the regular rear-axle ratio, with the result that when traveling in overdrive at 60 m.p.h. the engine turns over only as fast as at 42 m.p.h. in direct drive. No increase in maximum speed is claimed.

Air Chamber Moving Offices to Capital

NEW YORK — The Aeronautical Chamber of Commerce of America will move its executive offices from New York to Washington, D. C., Aug. 10. The new offices of the chamber will be located in the Shoreham Building at Fifteenth and H Streets N.W., Washington.

The aeronautical library and general information service will remain in New York.

June Manufacturing Activity Drops 2.4%

Automotive Industry Off 13% in Man-Hours Worked
Conference Board States

NEW YORK—Manufacturing activity in June, as measured by total man-hours worked, decreased 2.4 per cent, according to the monthly survey of the National Industrial Conference Board, based on reports from 25 industries. Employment decreased 2.1 per cent and total payroll disbursements 2.6 per cent, the first decreases in these two indexes since November, 1933. The pause in the advance in manufacturing activity indicated by a decline of 0.8 per cent in man-hours in May, the first check since November, has now extended to employment and payrolls.

In 13 of the 25 industries declines in man-hours ranged from 14 per cent in the northern cotton industry and 13 per cent in the automobile industry to less than one-half of one per cent in the iron and steel industry. Such declines were partly offset by increased man-hours in 12 industries ranging from 10.6 per cent in meat packing and 7.4 per cent in the manufacture of heavy equipment to less than one-half of one per cent in the chemical industry.

Hourly earnings in June of 58.6 cents were unchanged from May, while weekly earnings of \$20.71 were less than one-half of one per cent smaller than in May, by reason of an insignificant decline in average hours per week.

A comparison of conditions in June, 1934, with those in June, 1933, in the 25 industries as a whole shows increases of 29.9 per cent in average hourly earnings, 11.3 per cent in actual average weekly earnings, 2.8 per cent in real average weekly earnings, 31.9 per cent in employment, 12.6 per cent in total man-hours, and 46.7 per cent in payrolls, and a decline of 14.7 per cent in the average work week.

Similar stability was revealed by the index of changes in the cost of living. With an index of 78.8 in June, compared with 100 in 1923, the computed advance over May was less than one-half of one per cent and in none of the main components of the cost of living was there a change of as much as one per cent.

Thompson Products Adds Dry Cylinder Sleeves

CLEVELAND—Dry cylinder sleeves have been added by Thompson Products, Inc., as a companion line to the company's pistons and pins, for distribution by automotive parts jobbers. Approximately 30 sleeve sizes are now available for initial stocks at Cleveland and 12 factory branches.

NLRB to Review ALB'S Decisions

Wage and Hour Complaint
Settlements Not Involved

WASHINGTON — Decisions of the Automobile Labor Board in disputes and complaints involving Section 7a of the N.I.R.A. will be subject to review by the National Labor Relations Board, according to an unofficial interpretation of an administrative order issued early this week by NRA. However, decisions made by ALB on cases involving disputes and complaints over wages, hours, etc., will not be subject to such review.

The NRA'S order was issued for the purpose of modifying present methods of procedure to harmonize code machinery for the adjustment of labor disputes and complaints with the rules of procedure established by the recently created national agency.

John N. Willys Re-Wed; Mrs. F. E. Dolan, Bride

MIAMI, FLA.—John N. Willys, automobile manufacturer and former ambassador to Poland, was married to Mrs. Florence E. Dolan, of Fieldston, N. Y.,

this week following the granting of the final decree in the divorce proceedings instituted by the first Mrs. Willys who was Isabel Van Wie before her marriage to Mr. Willys 37 years ago.



R. E. S. Geare

Who has been elected vice-president in charge of sales and engineering of the L. H. Gilmer Co., Philadelphia

President To Call Industrial Parley

Decentralization Idea
Will Be Discussed With
Chiefs; Harriman Key Man

WASHINGTON—A conference of industrial leaders is to be called by President Roosevelt soon after his return to this country, according to word received in the Capital. The purpose of the meeting will be to discuss decentralization of industry, plans for which Mr. Roosevelt has long considered. The principal aim of the decentralization idea the President holds is the transfer of many factory units from congested city areas to semi-rural surroundings. In fact, the subsistence homestead experiment the Administration has carried on has this particular thought in mind. Also there is the idea in conjunction with this thought of giving men who will accept employment at the transplanted factories an opportunity to own their own homes and raise part of their food.

Men who will be invited to the conference, it is intimated, will represent between 60 and 70 per cent of the national industrial output. While the date for the meeting is indefinite, it probably will follow a meeting with Vice-President Garner and other political moguls next month. There is a possibility, according to circulated reports, that Henry I. Harriman, president of the Chamber of Commerce of the United States, will be asked to head a committee of industrialists in drafting the program for the conference. Mr. Harriman is known to be in accord with many of the President's ideas along these lines. He has been reported as saying that such a transfer of industrial units to suburban locations would do much to bring about social security.

One subject which is expected to be given serious consideration at the projected meeting is the budgeting of production schedules so that employees may have some idea of how much work to expect during a calendar year. There also is the likelihood that the results of the discussions will be seen in some of the social legislation the administration is known to be planning for the coming Congressional session. This program includes unemployment insurance, old-age pensions, conservation of land and water resources, and housing.

Duffy Succeeds Comings

DETROIT — John D. (Jack) Duffy has been appointed executive secretary of the Plymouth Salesmen's League, it has been announced by H. G. Moock, general sales manager for Plymouth and head of the league. Mr. Duffy assumes the position of A. V. Comings who died last June.

Estimate 225,000 August Output

(Continued from page 121)

week. Incomplete figures indicate that the total for the month should lie between 245,000 and 250,000 of which some 210,000 were passenger cars. This total is, of course, well above the comparative figures for July of last year.

The excellent maintenance of sales is probably responsible more than anything for the high August schedules. Since later July reports have come in there has developed a predisposition among manufacturers to hold production for at least the next few weeks close to retail deliveries without any material attempt to reduce stocks by cutting production. The situation is being carefully watched, however, since it is generally agreed that the new car stocks should go no higher than they are at present.

Final June registration returns make the total for that month 258,420 new cars and trucks as compared with 197,473 last year. Passenger car registrations totaled 223,642 against 219,163 in May, thus reversing the normal seasonal movement, and 174,219 in June, 1933. First half car registrations were 995,121 against 682,481 in the similar period last year. Truck registrations in June were 34,778 as compared with 23,254 in June a year ago. The six months' total of

truck registrations was 194,714, more than double the 92,830 sold in the first half of 1933.

June new car registrations were the largest in any month since May, 1931.

Chevrolet took first place in both cars and truck registrations in June, but Ford was ahead for the first six months. Ford cars and truck registrations combined in the first half were 356,617 against 345,672 for Chevrolet. Chevrolet, however, was first in truck registrations in the first six months.

Buick production for July totaled 9,648 compared with 10,756 in June and with 4,348 in July of last year. August schedules call for 7,341 cars compared with 4,849 in August last year.

Plymouth total production for July was 35,195 according to a factory statement. August schedules are estimated informally at around 25,000 units. Early reports from dealers indicate according to the factory that July domestic deliveries exceeded those for June.

Dodge retail deliveries week ending July 28 showed a total of 3,168 passenger cars and trucks which with Plymouth included give a total of 5,953, an increase of some 200 units over the previous week.

Motor Excise Taxes 12½% of US Income

Highway Users Conference
Reports 1934 Collections
Increased 70% Over 1933

WASHINGTON—During the fiscal year ending June 30, 1934, the Federal Government collected approximately one-eighth of its entire tax revenue from the variety of excise taxes on motor transportation, according to figures made public by the National Highway Users Conference, of which Alfred P. Sloan, Jr., president of General Motors, is chairman.

The conference tabulations are based on returns to the Treasury Department for the complete fiscal year and show that the motor vehicle owners of the country paid \$309,110,436 through the excise taxes on gasoline, lubricating oil, passenger cars, trucks, tires and tubes, parts and accessories, and pipe line transportation of oil.

Collections from the automotive taxes in 1934 were 70 per cent greater than for 1933, the total for that year being \$181,434,958, it was pointed out.

Commenting on the returns for the two years and the future outlook, Roy F. Britton, director of the National Highway Users Conference, said:

"Now that complete figures for the two years are available, we are in a better position to appreciate what a heavy burden these levies impose on motor transportation, as

well as the flagrant discrimination they involve.

"No one can argue that the Government of the United States should derive one-eighth of its total tax revenue from excise taxes on one form of transportation.

"The Federal excise taxes represent on the average a toll of approximately \$13 per motor vehicle, and increases by just that much or more the cost of highway transportation. They amount to one-third of the collections by the 48 states and the District of Columbia, to which highway users generally contend this field of taxation should be exclusively left for highway construction and maintenance purposes."

William Hastings Bassett

CHESHIRE, CONN.—William Hastings Bassett, newly elected president of the American Society for Testing Materials, died at his home here. Mr. Bassett, a pioneer metallurgist in the non-ferrous metal industry and directly concerned with many of its technologic advances, was metallurgical manager of the American Brass Co., Waterbury, Conn.

Frank Miller Promoted

MANHEIM, PA.—Franklin A. Miller, merchandising manager of the United States Division of the Raybestos-Manhattan, Inc., has been named replacement sales manager for Grey-Rock products. He will continue to direct Grey-Rock merchandising and advertising.

New NRA Deputy Well Known Automobile Man

Jo G. Roberts Succeeds
K. J. Ammerman in Charge
of All Automotive Codes

WASHINGTON—Jo G. Roberts, whose appointment was reported in *Automotive Industries* last week, has assumed his new duties here as NRA deputy administrator in charge of automotive codes. Under Mr. Roberts' supervision are the automobile manufacturing, A.P.E.M., including supplements, motor vehicle retailing, automotive wholesaling, storage battery, hearse and ambulance, fire apparatus, aircraft manufacturing and automotive maintenance codes.

Mr. Roberts is a well-known figure in the automotive industry, having been connected with the business since 1907. In that year he became a Buick dealer. In 1910 he became a G. M. traveler which led in 1912 to the managership of the Buick branch office in Chicago.

When C. W. Nash started his own company in 1917 Mr. Roberts followed him, becoming manager of the Chicago Nash branch office. He continued in this capacity until 1920 when he became Nash distributor in Philadelphia, an activity which he continued until early this year.

K. J. Ammerman, Mr. Roberts' predecessor as deputy administrator in charge of automotive codes, is understood to have been assigned to other NRA activities.

Commercial Credit Co.

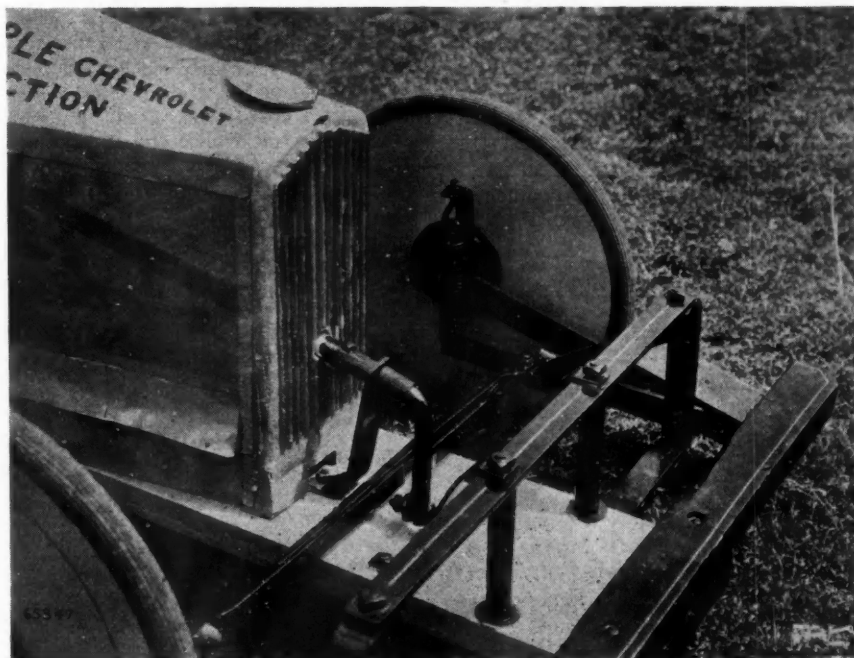
BALTIMORE—Commercial Credit Co. reports that net income credited to earned surplus after the payment of all interest and discount charges and providing for all Federal and other taxes was \$1,293,582 for the June, 1934, quarter, compared with \$1,085,986 for the March, 1934, quarter, or \$2,379,567 for the six months ended June 30, 1934. This compares with \$930,754.56 for the first six months of 1933 and \$4,400,732.24 for the year ended June 30, 1934.

N.A.C.C. Issues 1934 Facts & Figures

NEW YORK—The 1934 edition of *Automobile Facts and Figures*, the valuable compendium of automotive statistics issued annually by the N.A.C.C., was issued this week by the Chamber.

Postpone Taxi Hearing

WASHINGTON—The NRA has announced further postponement of a hearing on the proposed code for the taxicab industry from Aug. 9 to Aug. 15. The hearing will be held in the auditorium, Department of Commerce Building.



"Knee-Action" Soap Box Car

Winner in Chevrolet's "soap box car derby." Built by 12-year-old Jack Nicholas of Indianapolis with the aid of his father and 15 cents for materials the Nicholas' cellar didn't contain

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

Despite the high temperatures in most sections of the country last week, general business continued to progress. Retail business showed an improvement, and wholesale lines were more active. Steel operations fell off, but the output of electricity and lumber increased.

The Guaranty Trust Company's preliminary index of business activity for June stood at 71.6, as against 74.3 the month before and 70.3 a year ago. The company's index of wholesale commodity prices on July 15 was 52.1, as against 53.0 for both a month and a year earlier.

Crude Production Steady

Average daily crude oil production for the week ended July 21 amounted to 2,592,800 barrels, as against 2,600,750 barrels for the preceding week, and 2,673,350 barrels a year ago.

Current Consumption

Production of electricity by the electric light and power industry in the United States during the week ended July 21 was 0.6 per cent above that a year ago. The level of output during the week ended July 14 was slightly below that in the corresponding period last year.

Employment Off

Factory employment in the United States during June declined 1.7 per cent. Total payrolls declined 3.1 per cent.

Farm Receipts Higher

Gross farm receipts during June amounted to \$440,000,000, as against \$439,000,000 during the preceding month and \$423,000,000 in June, 1933. Of the June total, \$28,000,000 consisted of rental and benefit payments by the Government and \$1,000,000 of purchases of cattle by the Government in the drought areas.

More Carloadings

Railway freight loadings during the week ended July 21 totaled 614,864 cars, which marks an increase of 12,086 cars above those during the preceding week, a decrease of 41,516 cars below those during the corresponding period last year, and an increase of 112,952 cars above those two years ago.

Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended July 28 stood at 77.8, as against 78.1 the week before and 77.9 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended July 25 showed a decrease of \$2,000,000 in holdings of discounted bills. Holdings of bills bought in the open market and of government securities remained unchanged.

rium. At the same hearing, the code authority's proposal to establish differentials between the several distribution classifications of the trade was considered.

Check Out-of-State Trucks Entering Kan.

Port of Entry Law Fees Amount to \$112,406 in First Quarter of Year

NEW YORK—A total of 117,613 trucks, including 69,901 foreign vehicles, were checked on crossing Kansas borders during the first quarter of this year since the Kansas port of entry law became effective, according to a report furnished the N.A.C.C. by the Kansas State Corporation Commission Attorney. Sixty-five inspection stations have been established at the main highways entering the state where trucks are stopped and checked.

For the first three months of this year collection of fees has amounted to \$112,406. While the law is said to be beneficial to Kansas truckers, there is considerable discussion as to the effect it would have upon interstate commerce if adopted by the several surrounding states. Kansas state officials contend that the law's operation does not obstruct interstate commerce. State officials and legislators meeting at the Western Bus and Truck Conference in Salt Lake City, recommend approval of the law.

The principal provisions of the statute may be briefed as follows: Every motor carrier must enter Kansas via one of the highways where a port of entry station is located. Driver must supply "port" inspector with a card identifying owner of the vehicle and giving description of the vehicle and load, also specifying point of origin of shipment and intended designation. Card must indicate gross load of vehicle and cargo, rated tonnage, number of exempt miles, and nature, amount and coverage of public liability or other insurance carried on vehicle or its cargo.

The driver of the vehicle must file at station a certified copy of his manifest. If vehicle is found to be in safe and road-worthy condition a clearance certificate will be issued. Out-of-state carriers registered with Kansas Commission will be required to pay mileage taxes monthly as do Kansas carriers. An operator from out of state, not making regular trips into Kansas will be supplied with a special permit; operator will be required to pay in advance a fee under the following schedule—gross weight not exceeding 15,000 pounds, 1½ cents per mile; 15,000 to 25,000 pounds, 2 cents per mile; in excess of 25,000, 3 cents per mile.

The operator must be covered with liability insurance by company authorized to do business in Kansas, of not less than \$5,000 for any one person, or less than \$10,000 for all persons who may sustain injuries or be damaged. Violations of the law are punishable by a fine not exceeding \$100 or imprisonment not exceeding 30 days.

Mexico Increases Car & Truck Imports

MONTEREY, MEXICO—New automobiles of American manufacture are coming into Mexico at an average rate of approximately 360 a month, which is a large increase over such imports during the like period of last year.

With the revival of mining in various parts of the country, the demand for motor trucks shows a large increase. The trunk highway now being constructed between Laredo on the Rio Grande and Mexico City will be intersected by many lateral roads leading to mining districts. Some of these secondary roads have been already constructed and others will be built as soon as the main highway is finished.

The special purpose of the lateral roads is to accommodate trucks in transporting ores and supplies. The opening

of modern highways in the country is also causing many Mexicans to become tourist-minded, and travel promoters have adopted the slogan "See Mexico First."

Dale Joins Allsteel Co.

CHICAGO—James J. Dale has been elected vice-president in charge of sales of the Allsteel Press Co. Formerly Mr. Dale was vice-president in charge of sales for Henry & Wright Mfg. Co. in the Chicago and Detroit territories.

Tire and Battery Code Modification Hearing

WASHINGTON—A public hearing to consider the retail tire and battery trade Code Authority's application for modification of recently set emergency minimum prices was held yesterday (Aug. 3) in the Department of Commerce audito-

Unemployment Insurance Branded "Costly Experiment" In Report

NEW YORK—Following closely upon the prediction of Col. Robert G. Elbert, a member of the Unemployment Insurance Committee of President Roosevelt's Industrial Advisory Board, that Congress would enact some form of unemployment insurance at the coming session (*Automotive Industries*, July 14), Industrial Relations Counselors, Inc., has issued a report on the subject in which the statement is made that should the federal government embark upon such a program, it will be the most costly social experiment ever undertaken on a national scale.

The report emphasizes the fact that such a program will require a high order of competence in administration.

The statement of Industrial Relations Counselors, Inc., is contained in a summary of a lengthy report—"The Employment Exchange Service of Great Britain"—recently released. This report is the first of a series of studies to be conducted by this organization on the administration of employment services and unemployment insurance plans operative in the more important European countries. The counselors' headquarters are in Rockefeller Center and include in its directorate Rev. Raymond B. Fosdick, Owen D. Young, John D. Rockefeller, 3rd, Dr. Ernest M. Hopkins, Cyrus McCormick, Jr., William B. Dickson and Clarence J. Hicks.

"Industrial Relations Counselors, Inc.," says the report, "feels that American experience with State employment offices over a period of 40 years has been none too encouraging and has raised some doubt as to the practicability of building

up an efficient Federal-State employment service under the Wagner-Peyser act passed in 1933."

A digest is contained in this first report of the activities of the British system, giving statistical data on the numbers of full-time and part-time offices operating in the Empire, numbers of workers placed in gainful employment over a 10-year span, and the British method of shifting population to more fertile fields when necessary.

"Industrial Relations Counselors, Inc.," the report concludes, "is strongly of the view that the long experience of other countries cannot be overlooked with impunity. A study of the administration of the German system of employment service and unemployment insurance, which will appear in a few months, and those of other countries to follow later will enable interested Americans to contrast British, German, and other national procedures with an eye to their suitability for adoption in the United States."

NSPA Urges Drive Against Piston Ring Price Cuts

DETROIT—A drive to eliminate unscrupulous wholesalers and cut price retailers from securing a damaging competitive advantage in the sale of piston rings, pins and pistons is indicated in a letter recently sent out by H. N. Nigg, secretary of the wholesalers' division of N.S.P.A.

Mr. Nigg's letter points out that these price "chiselers" seek a competitive ad-

vantage by informing the customer that it is unnecessary to align connecting rods when installing these parts. It is recommended by the wholesalers division board of governors that manufacturers of such products inclose a slip with each package telling the uses of the parts and the necessity of aligning connecting rods when such installations are made.

Ford Accepts Hudson's Performance Challenge

BUFFALO—Hudson's economy and performance challenge broadcast in the newspapers recently was accepted here and resulted in comparative test runs by Ford, Hudson and Terraplane cars. The results were as follows: Economy, Terraplane, 24.18 m.p.g.; Ford, 22.42 m.p.g., and Hudson, 21.2 m.p.g. Hill-climbing tests conducted on a three-quarter mile course of about 7 per cent grade were won by Hudson with Ford second. One of the hill-climbing tests was from a standing start in high gear while the other was from a 10 m.p.h. start. Hudson also won the acceleration tests, one through the gears to 50 m.p.h. and the other from a standing start in high. Ford was second through the gears while Terraplane occupied this position in the standing start test.

Manufacturers Warehouse Policy Hit by NSPA Group

DETROIT—The practice of some manufacturers who continue to follow a warehousing policy which is non-cooperative to automotive wholesalers and which frequently is said to create an unfair competitive condition was criticized at a recent meeting of the board of governors of the wholesaling division of N.S.P.A.

In a resolution the board of governors recommended that manufacturers operating warehouses supply only their established jobbing outlets from these warehouses, and that all billing be handled in each case by the factory. This recommendation, it is stated by the board is in accordance with the warehousing resolution approved Dec. 31, 1932, and which was made a part of the N.S.P.A. warehousing code of ethics.

Approve Fire Apparatus Cost Accounting System

WASHINGTON—Approval by the NRA has been announced, effective Aug. 8, of a uniform system of cost accounting for the Code Authority of the motor fire apparatus manufacturing industry. The uniform cost formula, an eight-page typewritten document, was submitted by the code authority and will be used to set individual costs of members.



Now Its "Colonel" Maxon

Governor Ruby Lafoon (left) commissioned Lou R. Maxon (right) of Maxon, Inc., Reo's advertising counselor, a Kentucky colonel. Bring on the Mint Juleps!

Dealers Drive for Factory Aid

(Continued from page 121)

desired end. Should such negotiations prove unsuccessful at a date not later than October 1, the National Automobile Dealers Association at that time shall take a poll of its 30,000 members to determine whether or not a formal demand be made upon the manufacturers for the adoption of a uniform dealer contract providing for the enforcement and perpetuation of the code provisions which are necessary to safeguard the industry.

"We further believe that this program can only be carried out by acting at once, and offer our individual and combined resources to the limit of our ability and finances, knowing that all future organization work hinges upon the successful culmination of a satisfactory factory-dealer relationship."

Pressure on N.A.D.A.

This resolution, of course, serves to intensify the pressure that is being put on N.A.D.A. officials to take up code enforcement cooperation with the factories by the petitions demanding such action which are being circulated in many important states at the instance of the Michigan Automotive Trade Association (A. T. M. T. A., July 14, 1934). Moreover, steps are already being taken to get the members of each State Advisory Committee to send their endorsement of the Atlantic City resolution to the N.A.D.A. As a result of these urgings, it is understood that the N.A.D.A. is now working on a program for discussion with the factories.

The possibility of enlisting the active cooperation of the factories in enforcing the code to supplement whatever powers the government may exercise under the law to secure compliance, has been discussed with NRA, at least unofficially.

As has been previously pointed out, dealers are tending strongly to the opinion that factory cooperation is the last hope of code enforcement. NRA has made it clear that neither national nor local code authorities have any power to fine recalcitrants although thousands of dollars of such fines are reported to have been collected despite the fact that only the courts are authorized to assess such penalties. Voluntary contributions from violators, however, might be legal, NRA has indicated, provided the dealer penalized has previously assented to the use of this procedure and provided the committee making the assessment includes a neutral member. With such assent, it is held that levies of this kind can be collected by civil suit. These contributions, however, may not be demanded as an alternative to prosecution. Dealers appear to be skeptical of the possibilities of this program since they doubt that the necessary assents can be obtained.

Legal prosecution either under the penal section of the Act or by injunction is a third alternative, but the trade is not sanguine of the results to be obtained in this manner. In the first place, federal district attorneys have shown some reluctance to prosecute

trade practice complaints, it is reported, because of possible political repercussions. Moreover, where it is sought to punish with either fine or imprisonment, the case has to be tried by jury and, since a majority of any jury is likely to consist of car buyers, the reasons for doubting the efficacy of this procedure are obvious.

Because of this jury angle, the report that a federal grand jury in Chicago last week returned an indictment against a dealer there for violation of the fair trade sections of the code did not arouse as much enthusiasm as might be expected. The trade, of course, was glad to know that the government was going to bat on the case, but they are not too confident that the jury will convict when the case comes to trial.

In view of the conditions just outlined, the drive for factory cooperation is readily understandable—cooperation meaning cancellation where other forms of persuasion fail to whip offenders into line. Since the matter has not yet been placed before them formally, the factories have not taken any official position. However, it is regarded as extremely doubtful that they will acquiesce because of the commercial and legal difficulties involved.

Although the tendency in the trade is to brush aside the legal difficulties as more fancied than real, in some quarters it is regarded as doubtful that they can be treated so cavalierly either by dealers or factories. The anti-trust laws, it is urged, are still in force except insofar as they are repealed by specific provisions in codes under the Recovery Act. Neither the dealer nor automobile codes contain any warrant for either dealers or factories to act collectively along the lines proposed and, since the object of such collective action would be basically to maintain prices, there are reasons for believing that it would constitute an illegal restraint of trade. Moreover, the automobile code does not give the manufacturers any warrant to participate in the enforcement of the dealer code although dealers feel that if the factories got behind the code, they could get around this obstacle. Without such warrant, however, any steps

the factories might take to secure compliance conceivably might be construed as an anti-trust violation and almost certainly would involve the factory in civil suits for damages brought by dealers who had been cancelled.

Of course, the threat that the anti-trust laws may offer, might be removed by NRA. But in view of recent trends in NRA price fixing policies, there is at least some reason for doubting that such sanction will be forthcoming, although some elements in NRA are believed now to be favorable to the proposal. Incidentally, in this connection, it has been proposed that when the automobile manufacturing code comes up for renewal, the dealers might present a demand through the N.A.D.A. that it be amended to include fair trade practices covering the objectives for which the dealers are contending.

Canadian New Car Sales Up 53% Over June, 1933

OTTAWA—Sales of retail of new passenger cars, trucks and buses in Canada during the month of June show an increase of 53.5 per cent in numbers and 54.3 per cent in value, as compared with June, 1933. There was a total of 9,995 vehicles sold for \$10,236,278 in June, 13,557 for \$14,000,151 in May, and 6,512 for \$6,633,318 in June, 1933, according to government figures just released.

Gideons Reelect Fulton President for 6th Term

MILWAUKEE—Samuel A. Fulton, president of the Fulton Co., Milwaukee, manufacturer of automotive equipment and accessories, was reelected president of the Society of Gideons for a sixth term at the annual convention in Detroit. The fraternity is composed of Christian traveling salesmen and has for one of its major objectives the placing of a Bible in every hotel room in America.

CALENDAR OF COMING EVENTS

SHOWS

American Transit Assoc., Cleveland, OhioSept. 22-27
Cleveland (Automotive Service Industries)Nov. 19-23
New York Automobile ShowJan. 5-12
Chicago Automobile ShowJan. 26-Feb. 2

MEETINGS

American Chemical Society, Cleveland, OhioSept. 10-14
American Welding Society, New York CityOct. 1-5

ANNUAL MEETINGS

Natl. Assoc. of Motor Bus Operators, ClevelandSept. 21-22
Natl. Safety Council, Cleveland, O. Oct. 1-5
Institute of Traffic Engineers, ClevelandOct. 2-3

CONVENTIONS

American Society for Metals, New York CityOct. 1-5
American Transit Assoc., Cleveland Sept. 24-27
International Foundry Congress, PhiladelphiaOct. 22-26
American Foundrymen's Assoc., PhiladelphiaOct. 22-26
National Foreign Trade Council, New YorkOct. 31-Nov. 2

EXPOSITION

Natl. Exposition of Power & Mechanical Engineering (Biennial) New York, N. Y.Dec. 3-8

An Important New Feature

JOSEPH STAGG LAWRENCE

A REGULAR CONTRIBUTOR TO AUTOMOTIVE INDUSTRIES

IN continuing our efforts to improve constantly the editorial character of *Automotive Industries* and to broaden its scope of value and interest to the men in the automotive industry, we are pleased to announce an important new feature.

Beginning with the August 11th issue, Joseph Stagg Lawrence, one of the country's outstanding economists, will write each week, especially for *Automotive Industries*, a department of observation and comment on economic developments. He will deal with the present-day problems of business and finance, the economic activities of the governments in Washington and throughout the world, with tariffs, monetary reforms, business progress and business regulation, with the strength and weaknesses, the successes and failures of economic planning and experimentation and with all other matters on which business men should be well informed in order to plan intelligently in meeting the changed and changing conditions under which industry is and must be conducted.

Mr. Lawrence is exceptionally qualified by both training and experience for this undertaking, for the presentation of authentic information and observations which are "exact, fair-minded and often prophetic." Leonard P. Ayres has said of his writing, "the information is accurate, the interpretations economically sound and the accompanying comments are illuminatingly thoughtful." Mr. Lawrence writes with a freedom from prejudice. His contributions will be the product of independent thought without political inclination or bias. They will be not only practical but interesting and entertaining, for he has, in addition to a comprehensive grasp on the fundamentals in the economic scheme of things, the courage of convictions and a unique gift of expression and presentation.

Joseph Stagg Lawrence, a Phi Beta Kappa graduate of Princeton, was assistant and right-hand man to Professor Kemmerer, the world famous monetary expert at Princeton for four years and was also a member of the faculty of New York University. He was, for some time, contributing editor to *WORLD'S WORK* and later became editor of *BRADSTREET'S WEEKLY* and of the *ECONOSTAT*. He is now economist for the *REVIEW OF REVIEWS*.

Mr. Lawrence is the author of several books on economics including "Stabilization of Prices," which is used in the graduate schools of most American universities, "Wall Street and Washington," "Banking Concentration in the United States" and "How to

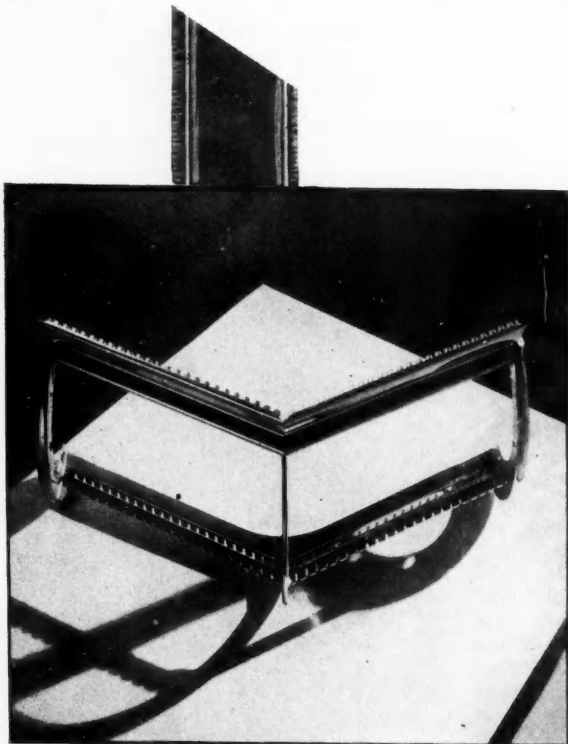


Joseph Stagg Lawrence
A regular contributor to *Automotive Industries*
beginning with next week's issue

Understand Money." He is a frequent speaker before the National Industrial Conference Board, various economic societies and associations of bankers and business men and has acted as consultant for several of the country's largest industrial organizations.

Mr. Lawrence's department, addressed to the executives in the automotive industry, will be found regularly in *Automotive Industries* beginning with next week's issue.

Research Points Way to Improved Methods



Bottom element of Cadillac radiator grille assembly is a zinc alloy die casting

A brief survey reveals several schools of thought on the matter of plating procedure, predicated undoubtedly upon differences in methods of corrosion testing and ideals of quality. According to Dr. William Blum, chemist of the Bureau of Standards,

this subject was discussed in considerable detail at a conference held in Washington early this year, and it was agreed by those present that there is need for careful study including extensive exposure tests to determine the relative value of various proposed methods of plating on zinc. There seems to be unanimity on one point at least and that is that considerably thicker deposits are recommended than formerly, in some cases with a total thickness of about 0.001 in.

Dr. Blum points out that such a project would fit in the proposed extension of the exposure tests now being completed of plated coatings on steel. This investigation has been carried out by the cooperation of the Bureau of Standards with the American Electro-Platers Society and the American Society for Testing Materials with the assistance of a research associate of the American Electro-Platers Society. If it is found feasible to raise the funds necessary for continuation of his

services, it is expected that further tests will be made which will include the value of plating on die-castings, brass, and other nonferrous materials.

Regardless of the procedure finally established, it is well to bear in mind the practical objective proposed by Anderson and Reinhard in an article in *Automotive Industries* some time ago in which the authors said in part: "The first step in the development of a specification is, of course, the selection of a limiting value for the minimum thickness of coating which will give satisfactory protection and, at the same time, will not demand an uneconomical excess thickness. In the final analysis the selection should be made on the basis of service tests."

Obviously the nature of the corrosion study must have a profound effect upon the plating specification. Anderson and Reinhard have pointed out that in the past the salt spray test or some similar accelerated test has been used with complete disregard for outdoor exposure tests. They feel that this is a dangerous procedure since "there is no law of nature which prescribes that the resistance of a plated coating to the action of a sodium or calcium chloride mist shall parallel the resistance to normal weathering."

Based on pioneer research work extending over a period of about six years, The New Jersey Zinc Co. has developed a simple, economical plating procedure which is found to give adequate protection under normal service conditions. It consists of a heavy deposit of nickel (0.0003 in. thick) directly on zinc, topped by a coating of bright chromium plate. Perhaps the largest contribution made by this independent research project lies in the discovery that while a certain minimum coating of nickel (0.0003 in.) is essential for adequate protection, heavier coatings are uneconomical with the solutions in use at the present time, and undesirable since in present practice

EYE appeal and durability of decorative chromium-plated finishes—the chief criteria in consumer acceptance and satisfaction—are matters of more than passing interest when it comes to automobile trim, hardware—both interior and exterior, radiator ornaments and the other embellishments that serve as a foil to the body finish.

With the ever-expanding use of zinc alloy die castings in automotive construction, plating experts, metallurgists, and others are devoting considerable attention to the matter of adequate plating specifications for such products.

by Joseph Geschelin
Engineering Editor, Automotive Industries

of Chrome-Plating

Procedure for zinc alloy die castings developed from outdoor exposure work

they are too often subject to cracking.

Carl Heussner of the Chrysler Corp., in a recent paper before the American Electro-Platers Society, endorsed substantially the same procedure as that of The New Jersey Zinc Co., recommending further that the present type of nickel solutions for plating zinc alloy die castings be operated with a high pH. Mr. Heussner recommends a coating of not less than five grams of nickel per sq. ft. (0.00024 in.) which is slightly less than the thickness recommended by The New Jersey Zinc Co.

In the opinion of some experts, there are certain dangers attending the use of a copper coating directly on zinc. One lies in the mutual chemical action between zinc and copper which tends to dissolve the copper coating. If only a "flash" of copper is used it will dissolve and leave the nickel middle coat afloat without an anchor. To avoid this condition it is necessary to use a very heavy copper coating under accurately controlled conditions. Mr. Reinhard of The New Jersey Zinc Co. also points out that there is a hazard in going to the heavier coatings of copper since the strata between the zinc base and the copper plate, which is made up of a solution of zinc and copper is often brittle and shows a tendency to form blisters.

To facilitate the production problems involved in the plating of nickel directly on the zinc surface, one prominent organization has done considerable work with a new nickel plating bath which operates at high current density and is said to deposit a very heavy coating in an economical period of time. So far the

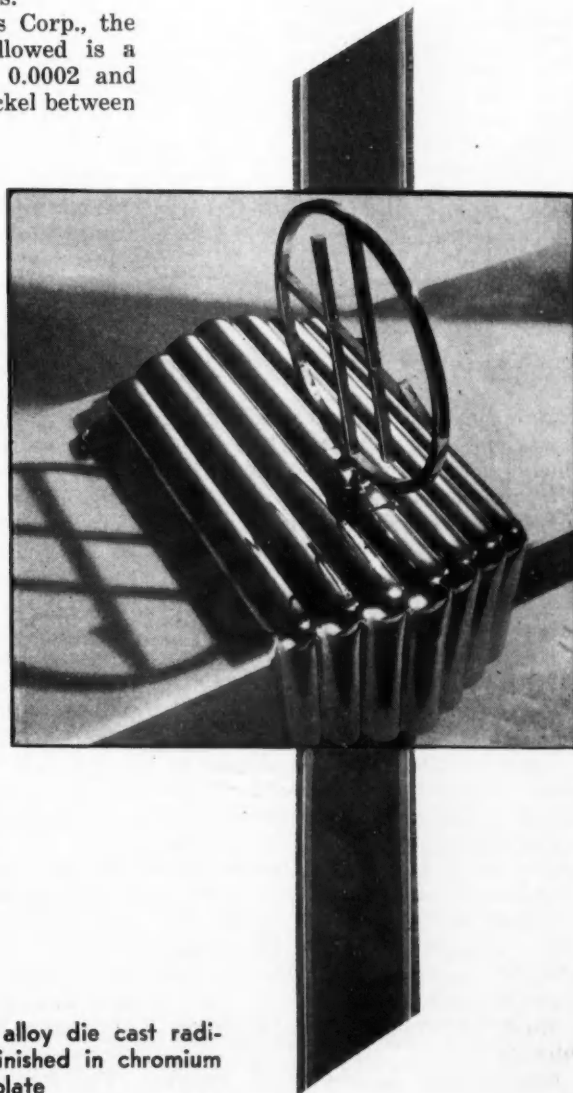
work has been confined to small experimental and semi-commercial runs. No doubt a public announcement of the process will be made just as soon as it has stood the test of some commercial runs.

In the General Motors Corp., the method most widely followed is a copper coating between 0.0002 and 0.0005 in. followed by nickel between 0.0005 and 0.0007 in. with total thickness of the two metals, 0.001 in. In some cases it is preferred to deposit nickel first in which case the first layer of nickel is not less than 0.0002 in. and the top layer of nickel not less than 0.003 in. The layer of copper between the two layers of nickel is thick enough to make up the difference between the thickness of the two nickel deposits and 0.001 in. Specifications call for a chromium thickness of 0.000025 in.

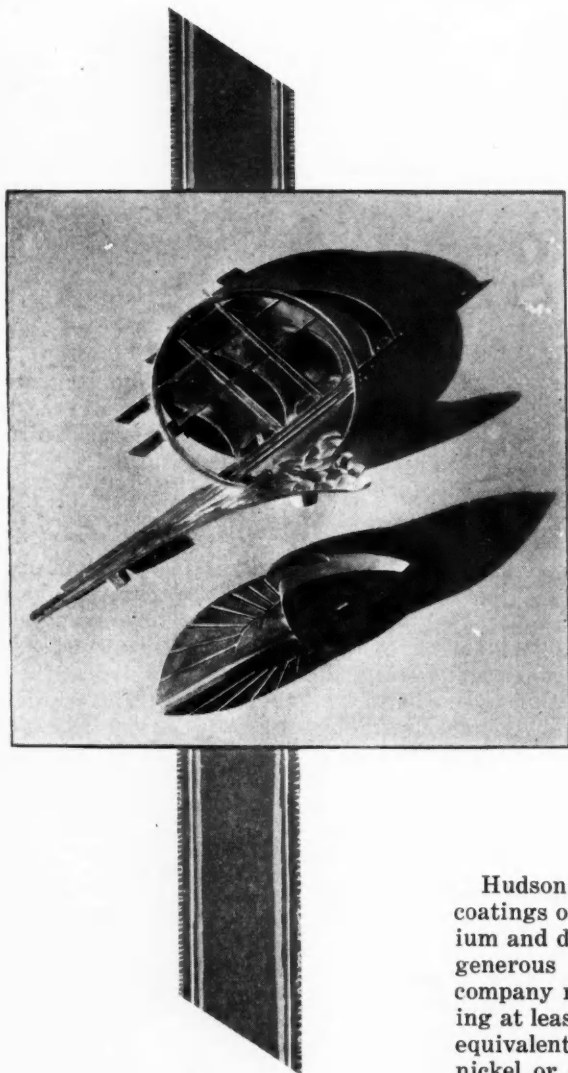
General Motors has two standard specifications for plated die castings as follows, the Class B specification being recommended on interior hardware.

Class A—Chromium on Die Castings for Severe Exposure.

Copper plate, nickel plate, buff and chromium plate. (Alternate layers of copper and nickel are acceptable provided: the total thickness is as specified below; no layer is less than .0002 in. thick, the nickel imme-



Hupmobile zinc alloy die cast radiator ornament finished in chromium plate



Plymouth radiator ornament left unplated to show the normal surface of zinc alloy die casting

by purchaser required.

At Cadillac Motor Car Co. the plating specification calls for copper, nickel, chromium; copper plus nickel being specified 0.001 in. thick. Copper is to be not less than 0.0004 in. and nickel not less than 0.0004 in., preferably 0.0006 in.

Hudson Motor Car Co. specifies coatings of copper, nickel and chromium and demands in a general way a generous coating of copper. The company recommends for each coating at least 300 amp. min. per sq. ft., equivalent to about 0.00025 in. of nickel or copper.

Tests for quality control vary rather widely as will be evident from the following notes. For example, the General Motors Class A specification requires a finish which must withstand a 24-hr. salt spray test while the Class B specification calls for a 12-hr. salt spray test. However, both finishes must withstand a ½-hr. hydrogen sulphide test in which the hydrogen sulphide gas, saturated with water, is passed into a vented container over the parts to be tested. After exposure to the gas the parts should show no discoloration on significant surfaces.

The Cadillac specifications given above call for 24-hr. resistance to salt spray together with microscopic examination for the thickness of the plated coatings also the hydrogen sulphide test to prove that the chromium plating thoroughly covers the nickel.

Hudson specifies that the plating must withstand a 45-hr. salt spray test, the salt spray consisting of a 20 per cent solution of sodium chloride.

The Pierce-Arrow Motor Car Co.

leaves the method of procedure entirely up to the vendor. However, all chromium plated zinc alloy die castings are required to withstand a 20-hr. salt spray, 20 per cent by weight solution, without showing any sign of corrosion of underlying metal on significant surfaces.

Packard quality control requires that the parts shall have a mirror-like finish and that there shall be no buffing or polishing marks shown. The thickness of the nickel plating is checked by cutting out a section of the work, analyzing for nickel gravimetrically, and calculating the amount of nickel in grams per sq. ft.

Even a cursory study of the situation shows an urgent need for a simple plating procedure yielding the greatest economy consistent with the desired quality standard. As mentioned earlier the "break-even" point established by The New Jersey Zinc Co. after a number of years of outdoor exposure tests, is a coating of 0.0003 in. of nickel. It was found during the course of this investigation that nickel coatings of less thickness fail prematurely and although greater thicknesses of nickel offer still better protection, the "break-even" point seems to be quite consistent with the average need of automotive service.

The following may serve to summarize the situation as it exists at the moment:

1. Minimum thickness of nickel directly under the chrome plate should be 0.0003 in.
2. If a copper coating is plated directly on the zinc base it must be a heavy coat and not a "flash."
3. Where multiple coats are used, the nickel under the chromium plate must be not less than 0.0003 in. in thickness.
4. It seems desirable to establish plating specifications on the basis of outdoor exposure tests as these tests appear to be more consistent with practical service conditions.
5. Plating procedure must be properly controlled to assure uniformity of coating and adherence to specification.

Small Work

From Germany comes word of a new cylindrical grinder designed for very small precision parts, produced in large volume. Its range is 0.02 in. to 1 3/16 in. in diameter and up to 7 7/8 in. long. Accuracy is said to be of the order of 0.001 mm. (about 0.00004 in.). The wheel turns over at 4200 r.p.m.

diately beneath the chromium is at least .0003 in. thick). Total plate thickness .001 in. min. Nickel plate thickness .0005 in. min. Chromium thickness .000025 in. min.

Must withstand 24-hr. salt spray test.

Must withstand ½-hr. hydrogen sulphide test.

Engineering approval of finish by purchaser required.

Class B—Chromium on Die Castings for Moderate Exposures.

Nickel plate, buff and chromium plate. (Copper may be used in addition to the nickel providing nickel requirement is met and providing copper layer is not less than 0.0002 in. min. thickness.)

Nickel plate thickness 0.0002 in. min. Chromium plate thickness 0.000025 in. min. Must withstand 12-hr. salt spray test.

Must withstand ½-hr. hydrogen sulphide test.

Engineering approval of finish

A. F. of L. Reviews

A Year's Activity in the Automotive Industry

THE socio-economic ills of the automotive worker as the American Federation of Labor paints them, his struggles with management for union recognition, his reputed gains in wages and conditions of work through unionization, compose a symphony of editorial comment barbed with sharp criticism and charges of non-consideration of human and legal rights of workers in the current issue of the *American Federationist*, the Federation's official gazette.

The meat of the issue consists of reports from two dozen automotive locals in which their activities are summarized. These reports are made the occasion for the national organization once again to hurl its familiar charges against the industry and to boast of the progress it has made under the N.I.R.A. Since 40 pages—more than half of the editorial content of the issue—are devoted to the automotive industry, it is obviously impossible to do more than cover the highspots here.

"The past year has seen a growth and development of unions in the entire automobile industry never surpassed in any other industry," William Collins, Detroit representative of the A. F. of L., states in an article under his name. Subsequently it is asserted that a majority of workers have been organized in the past year. Other claimed achievements include wages close to the 1928 scale, that collective bargaining is now under way in a wide variety of automotive plants, and the protection provided by the President's settlement for men with dependents and for seniority.

The charges and criticisms directed at the industry in general cover familiar ground. Seasonal fluctuations in employment come in for heavy fire and the accusation is made that seasonal influences have been accentuated to build sales without proper consideration of human factors. High wages in the industry are described as an illusion due to the seasonal nature of employment, and it is charged that wages have never been high enough to enable workers to live during the entire year in any kind of comfort or safety. Moreover, it is asserted that the manufacturers' claims of high wages have brought workers from all parts

of the country who, when the seasonal peak is past, have been a burden on the relief resources of the community. The hope also is expressed that within the coming year the Automobile Labor Board will bring about a greater degree of stabilization in employment.

Conditions of work are painted as inhuman and intolerable and it is charged that processes have been speeded up beyond the limit of human endurance. Production methods, it is asserted, put a premium on youth and the custom of the industry is said to be to refuse jobs to men over 40 to 45 years old.

The manufacturers also are indicted for flouting Section 7 (a), a mandatory provision of their code "which gave them exemption from the anti-trust laws."¹ They are charged with intimidation, discrimination and coercion in violation of this section of the Recovery Act. Employees are said to have been forced to join company unions and the employers are accused of espionage on the workers' organization activities.

Turning to the industry's economic position, the *Federationist* says: "Changes in prices this year are to a considerable extent responsible for the fact that production is not greater. . . . The price increases of this year are the first in six years, during which time prices have been steadily lowered." Pointing out that in June of this year steel prices were only 3.2 per cent less than the 1929 level, the *Federationist* states that the increase in automobile prices was brought about largely by the sharp increases in the cost of steel. But almost in the same breath, it is admitted that wages in the industry also are again near the 1929 level due to the strength of the unions, but there is no accompanying admission that maybe higher wages had something to do with higher prices.

The reports from the correspondents for the 24 locals, which have been referred to previously as the meat of the issue, apparently were written in response to a request from A. F. of L.

¹ The automobile manufacturing code does not grant any exemption from the anti-trust laws. The A.F.E.M. code does grant exceptions but they are operative only for a few product groups at the present time.

headquarters. This request appears to have asked the locals to describe their most successful methods of obtaining and keeping members, whether they used A. F. of L. literature, the help received from organizers, etc.

Among the methods described as successful by the correspondents were key men in each department to carry on organization work; election of capable officers; effective publicity programs; good speakers at meetings; fraternalism; social events; death benefits, giving members union responsibilities and keeping a definite program of action before the men. A feature of the reports is the almost total absence of a belligerent attitude although one correspondent does warn that they can get tough if called upon to do so. The reports also give evidence that the locals are having difficulties in maintaining membership in the face of seasonal lay-offs.

In the summaries which follow of the reports from the individual locals, every effort has been made to handle the subject matter objectively as has been the intent in the preceding discussion of the feature articles in this issue. *Automotive Industries* has made no attempt to check the accuracy of any of the statements made by the locals. The headings on the summaries are as they appear in the *Federationist*.

HUDSON MOTOR CO., Local No. 18,312: Membership represents three plants devoted to manufacturing of bodies, axles and motors, and car assembly. Have chosen two men from each plant who, with president of local as chairman, act as negotiations committee with management. Report varied success in establishing right of union executives to represent the workers, but have obtained recognition for shop stewards in various departments in taking up grievances with their foremen or superintendents. Working with Director of Personnel on lay-offs. "I have appeared before the Automobile Labor Board here in Detroit several times . . . having difficulty getting the proper interpretation of the President's agreement on the laying off of all workers. . . . As it now stands we are in practically the same position we were before March 25. What it amounts to is that we are back to the old Merit System . . . much has been accom-

plished along the line of wage increases. . . . Weekly earnings of the employees have been increased until recently through the efforts of the organization. . . . Skilled labor runs from \$1 to \$1.25 per hour . . . semi-skilled from 80 cents to 95 cents . . . base of common labor 55 cents and up to 65 and 70 cents per hour in some jobs."

STUDEBAKER CORPORATION, Local No. 18,310: Claim organization of several thousand. To get members, permitted individual to signify intention of joining by paying as little as 25 cents toward initiation fee. "We, as an organization, have not, as yet established a collective agreement except in an indirect manner . . . have secured revision of factory rules where they seemed to work an injustice . . . have been given assurance by the management of the Studebaker Corporation that they are perfectly willing to meet with us at all times in regard to hours, working conditions, etc. They have not tried to foist any company union on us. . . . Shop or departmental grievance committees are organized or in the process of organization . . . still much left to be done in the settlement of sufficient wage schedules that will give employees a wage that can be considered as enough to enjoy life, liberty and the pursuit of happiness, but we believe that this can be best accomplished by a concerted action on the part" of all federal unions. . . . "Some individual cases may be settled by our local union but because of the competitive factor in industry and the fact that one company does not want to pay higher wages than another in a certain wage bracket, we suggest that a general wage conference of automobile executives and union executives to be called by the government to consider a standard of wages for the entire industry. To standardize wages, the elimination of piece and group work, would be necessary and a classification according to skill required would be necessary."

STUDEBAKER-BENDIX PRODUCTS, Local No. 18,310: "When the company established a company union, we got members by the hundreds. . . . We have found that it is much harder to keep members of this kind than to get them. The enthusiasm wears off and they quit paying dues . . . getting a Safety Committee appointed to turn in all violations of safety rules and unsafe jobs." By threatening strike, the president of the company was called in (report not clear as to whether Bendix or Studebaker is referred to) and the strike averted by a 10 per cent wage increase and re-employment of two men who charged discrimination. "Our present trouble is lay-off of married women members whose husbands are also employed at the plant. This has proven a tough problem, as there is a great difference of opinion among the members on this subject. There is proof of discrimination in this lay-off. . . ."

HUPP MOTOR CO., Local No. 18,432: "Have had more than ordinary success in establishing the right of union executives to act for the workers in our union. Our collective agreement was secured by the wage committee, which was selected by the members . . . since the Auto Code first

came into effect, weekly earnings have been increased in most cases over 50 per cent. The work week has been stabilized."

MUSKEGON MOTOR SPECIALTY CO., Local No. 19,215: ". . . had some trouble in establishing rights of our representatives but we succeeded in having them recognized by each member of our union signing a statement that these men were elected to represent them." Prior to the code wage rates for production men were 30 to 37½ cents; non-production up to 50 cents. When code went into effect, rates below 40 cents were raised to that figure but rates above 40 cents were not raised. Following demands of the union, it is stated, wages rates were raised to 50 cents for common labor up to 65 cents for other classes according to skill. Get time and a half for overtime and 2½ cents per hour more for night work.

BRUNN COMPANY, Local No. 19,276: Received assurances that company had no objections to organization and that it would meet union committee for discussion. Company stated that it would not concede to any outside influence and made the men understand that it had used up the biggest part of its reserve fund in giving the men work. Promised some kind of increase on individual basis and as result some got 5 cents more per hour, some 2 cents and others none. Claim membership of all but one employee, but indicate seasonal slump in business is making it hard to maintain interest.

MOTOR WHEEL CO., Local No. 18,794: "We have one serious drawback in our plant and that is the company union. It has never done us any good, but some of the men think it is all right. . . . We have not established any right of union executives to act for workers in our union. . . . We have not secured a collective agreement with the management. . . . Since code has been in effect our weekly earnings have been smaller due to reduction in hours. We received a 10 per cent wage increase. Our production rate is 65 cents per hour, but we cannot average that, because production is set too high."

HEXCEL RADIATOR CO., Local No. 19,055: "Have been successful in establishing the right of our union executives to act for the members . . . have also established a collective agreement which provides that the members of the Automobile Radiator Workers Union, employed by this company, shall select a shop committee and a shop chairman whose duty it shall be to see to it that the provisions of this agreement are observed by all parties and who shall be recognized by the company. . . ." Agreement provides appeal machinery and ultimate arbitration; no strike or lockout to take place until this machinery has been utilized. "Our weekly earnings have been cut greatly since the code went into effect . . . because we went on the 7-hr. basis from the 8-hr. basis, but they did not increase our hourly rate. Since we organized we have got a raise of from 5 to 15 per cent. This does not cover, however, what we lost by losing that

extra hour per day on account of the code."

COLUMBUS AUTO PARTS COMPANY, Local No. 18,453: "Grievance Committee has privilege of meeting with the management at any time . . . have not as yet succeeded in getting a signed agreement . . . hourly earnings have been increased 25 per cent . . . hours reduced to 7 per day . . . two weeks' pay check has about reached half of what we received at our top wages."

PIERCE ARROW MOTOR CAR CO., Local No. 18,636: "Successful in securing a 10 per cent increase. . . . Conditions are 80 per cent better throughout the entire plant since we joined the American Federation of Labor. . . ."

ATLAS, MELLING, FEDERAL, LANSING AND LINDELL COMPANIES, Local No. 18,875: "We have established collective bargaining (for our members) with our management. We demanded a 20 per cent increase but settled for 10 per cent. . . . Our company (report does not indicate which company) ignored the P.R.A. but through our union we have cut the hours from 60 to 44½ per week and are trying for a 40-hr. week."

CLEVELAND FISHER BODY, Local No. 18,614: Union representatives met with General Motors and Fisher Body officials in May after A. L. B. decided they could bargain for an unknown number of men pending certification of membership lists. Demanded 8-hr. day, five-day week, time and a half for Saturday and double time for Sunday and all national holidays, seniority rights and no discrimination. Company countered with 9-hr. day, five-day week, time and a half for Sunday and the right to have stewards in each department. Local fought against 9-hr. day and it is still under negotiation. Stewards are now organized and have adjusted several minor grievances. "With the gradual development of conferences to settle our collective differences, the union situation if not as spectacular as the more violent means, at least for us, proved much more satisfactory in obtaining results. . . . But with the conference system it was less easy to hold the interest of the membership body." To make the members understand that the conference method is actually producing results, the union is now publishing a newspaper known as the *Labor Digest*."

FLINT FISHER BODY PLANT, Local 18,331: "Some of the outstanding cases (of discrimination) have been settled and the men reinstated . . . but there are others, just as deserving, that have not been settled . . . every reason to believe that the National Automobile Board will pass . . . on these remaining cases in the near future. . . . There have been disputes as to representation, the company maintaining that in all conferences with our representatives the 'company union' representatives must be present. Our union refused. . . ." Strike called in May because company refused to negotiate change in piece rates on new models and "because 25 men who ob-

jected to this were discharged." Satisfactory settlement reached at meeting between A. F. of L. representative and C. T. Fisher and W. S. Knudsen. It provided for return to work "including the 25 men who had been fired," management to discuss grievances with union committee and failing agreement dispute to go to the A.L.B., all adjustments to be retroactive to May 17. Under settlement, union committee has had two meetings with management with company union excluded; rate and working conditions have been adjusted.

TWIN COACH CO., Local No. 18,544: "Of five hundred employees, 98 per cent are now members of this union . . . company recognized union and signed papers to this effect. . . . (Note—recognition does not involve closed shop) got an adjustment of wages for the lower paid men and an adjustment on certain piece work prices . . . wage increases granted amounting to 10 to 25 cents per hour under our classification . . . general manager working wholeheartedly with union . . . working on an agreement covering all rights and privileges of the worker, guaranteed to be effective as of June 1, 1934 . . . expect to create a board of adjustment to settle all our problems locally."

CHEVROLET AND FISHER BODY (Flint), Local No. 18,567: "Have not established a collective agreement as yet . . . have had very little trouble over code enforcement as we have never had any cases of discrimination." Prior to the code worked as much as 70 hr. in one week but so far work seems to have been spread more evenly. ". . . have more men at work and our basic rate has been raised from 76 cents to 92 cents. . . ."

YORK HOOVER COMPANY, Local No. 19,349: Following two-day strike in May obtained "agreement with the management which was satisfactory . . . an increase in pay ranging from 5 to 20 per cent according to merit."

LANSING FISHER BODY CO., Local No. 18,553: "The success we have had in establishing the right of union executives to act for the union has been very encouraging. We have asked for only two meetings and both have been granted. . . . Have not tried to get pay increases as a whole but are working on little things that go to make better working conditions . . . asked for . . . a seniority roster, which was already being prepared . . . in accordance with the rulings of the Labor Board at Detroit. . . . A system of paying so-called "Group Leaders" 5 per cent additional to the rest of the group (the group paying the 5 per cent) was taken up and promptly discontinued. . . . We have had no labor trouble. . . . We have tried to discourage strikes. . . . Our advice to the members has always been to get a meeting with the management. . . . We have succeeded so far in this and it is our sincere belief that this is the better method. . . ."

PONTIAC FISHER BODY, Local No. 19,173: "When the threatened strike was announced . . . every em-

ployee to a man joined our union. Now that peace is declared . . . some of the newer employees . . . are becoming disinterested." Took up 30 discrimination cases with management and the A.L.B. and nearly all were rehired. "We have no agreement with the management. . . . It seems the management is trying to do better by us so we won't get tough. . . . Of course, we have that fool company union here, but it does not bother the old heads . . . but others belong to it, thinking they have to." The management has agreed to meet with union committee once a month or oftener and to deal with union shop stewards.

DETROIT DODGE MOTORS, Local No. 18,277: ". . . although we have met with organized resistance on the part of our management, we have . . . improved our position about 2000 per cent." Have had conferences with management on discrimination cases . . . do not pay any attention to the company union . . . are laying plans for open meetings and a determined membership drive when production picks up.

MOTOR METAL MFG. CO., Local No. 19,192: Representatives elected by local recognized for collective bargaining. Obtained 10 per cent increase in March 1 piece rates and 10 to 25 per cent increase in hourly rates, time and a half for time over eight hours, double time for Sunday, rights of seniority and of married men with dependents established, etc.; machinery set up for adjusting disputes over rates set by time study, some classifications transferred from piece to hour rates, employees get duplicate time tickets for check on pay.

NASH MOTORS, Local No. 18,785: "A group piece work system was in effect under which the men never knew how much they earned. . . . Compulsory contributions toward a company welfare fund . . . were exacted and a semi-compulsory check-off of contributions to the Central Association . . . was in force. These conditions have been entirely changed (since the strike) . . . The group piece work system has been reformed so that the workers know approximately what they earn from day to day. Wages are 25 per cent higher on an average—The Racine Nash workers boast that the Nash-built Lafayette car . . . is the only 100 per cent union made automobile in the United States. . . . To give the company due credit, no discharges were made for union activity . . . the big impetus (to union membership) came when the company announced a company union scheme in September . . . the company's election of employee representatives under the company union set-up was a grand farce. . . . Much of this long report is devoted to a detailed account of the strike. "While the strike settlement did not call for a closed union shop, the result has been the same as if it had. All of the approximately 1500 workers in the Racine plant are union members. . . . There have been no disputes of any consequence since the resumption of work and the company has shown a willingness to work with the union."

DETROIT MOTOR PRODUCTS CO., Local No. 19,278: "We have named three key men to act for the union in all negotiations. . . . We have never had any trouble in getting a conference whenever we asked for it." A short strike in April was settled with the help of the A.L.B., the settlement providing detail piece rate and group bonus adjustments, setting minimums at 50 and 44 cents per hour respectively for men and women, establishing the A.L.B. rules for lay-offs, and setting up machinery for mediation. The union has no signed agreement with the company.

KELSEY-HAYES WHEEL CO., Local No. 18677: Majority of workers claimed to be members of local. "The union representatives have never had any trouble in meeting the management. . . . The company organized a company union at the same time our union was being formed. . . . We have never had any cases of discrimination . . . we have established very satisfactory collective bargaining relations . . . we have received a 5 per cent general wage increase and additional 5 per cent for production workers. . . . The same hourly rates prevail now as in 1928 . . . the work week was 54 hours. Now it is 42 . . . we have been able to secure the establishment of seniority rights in lay-off and rehiring . . . time and half is paid for Sunday. . . . The company has been attempting to institute a plan of insurance through the company union. Our union has protested. . . ."

McCORD MFG. CO., Local No. 19,545: "We have had no trouble about our union executives acting for our local. . . . The only major question we have brought up so far was the 8-hr. day . . . we had been working 40 hr. per week over a 6-day period. . . . We are now working five days. . . . Previous to the code we had been working as many as 70 hr. per week and the hourly wage at that time was 29 and a fraction cents as a minimum, but at present our hourly wage is established at 46 cents per hour as a minimum."

French Patent Covers Rear-Engine Design

A FRENCH patent (No. 731,741) has been issued to Dr. H. C. Porsche on an automobile with a radial engine mounted directly on the differential housing, with a tubular backbone and oscillating driving axles. Two arrangements are illustrated, with the engine at an angle of approximately 45 deg. ahead of and behind the driving axle respectively. Drive is by worm gear or hypoid gear, and the transmission is located on the opposite side of the axle from the engine and clutch. Both three-point and two-point mounting of the powerplant are provided for, the latter to allow it to oscillate under torque variations.

"Moving Ground" Developed for Wind Tunnel Testing of Car Models

by Alexander Klemin, S.M., LL.D.

Professor in Charge, Daniel Guggenheim,
School of Aeronautics, New York University.

WITH the advent of the streamline automobile there has come up a new problem in the technique of the wind tunnel in which models of airplanes, automobiles and trains may be tested for air resistance. Since the wind tunnel was the accepted method in aeronautics for the testing of air resistance or drag, it was only natural that the wind tunnel should also be called into play for the testing of automobile air resistance.

In aeronautical work the model, however, is placed in the center of the tunnel and the restrictions in flow about the model are due only to the presence of the tunnel walls for which corrections can be made, nor need the ground be represented for airplane model testing.

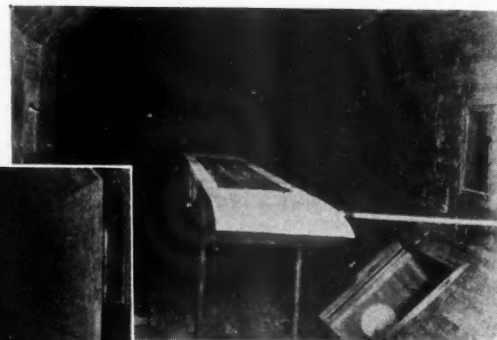
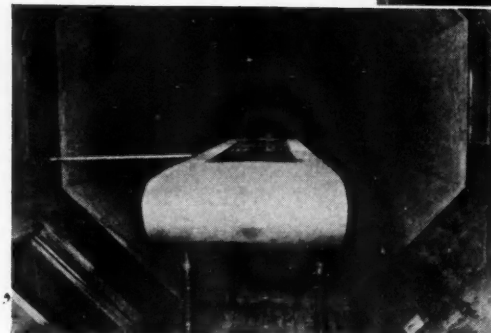
In testing streamline automobiles or trains another similarity must be met. When the automobile is moved in still air along the road the relative motions are as follows:

1. The air is moving relative to the car at a speed V .
2. The ground is moving relative to the car at a speed V .
3. The air relative to the ground is at rest.

Wind tunnel men who have had to test automobiles have adopted one of three methods.

The first method was to test the model in the free air stream of the tunnel neglecting the effect of the ground. This method is obviously in error, since the constriction of the flow by the presence of the ground is not represented. The cross-wind force or lift is also not represented, and the cross-wind force introduces indirect drag.

The second method employed is that of the mirror method. Here a model to be tested is duplicated by an exactly similar model placed up-side-down in such fashion that the distance between the model and the dummy is exactly equal to twice the distance between the model and the ground. This method is theoreti-



Views of the "Moving Ground" in the wind tunnel showing the drive shaft extended through the side

cally correct as can be readily seen, but it does not work out in practice because vortices generated by the model and the drag cannot be exactly synchronized. Theoretically the mirror method should give the equivalent of a dividing boundary in practice. The peeling of vortices is not synchronized and therefore there is a flow across the imaginary boundary.

The third method has involved the introduction of a ground board placed a fraction of an inch below the wheels of the vehicle being outside. This method provided restriction of flow across the boundary, but on the other hand the boundary layer retards the stream along the surface of the board and the air no longer is of the required velocity. This is important, since the low surface of the resistance of the vehicle to be tested may be a large fraction of the whole.

Attempts have been made to remove the boundary layer by applying suction to the under surface of the board, but this has not been very successful.

Realizing these difficulties there has been developed at the Daniel Guggenheim School of Aeronautics, under the author's direction, a method of test using the ground board whose top surface is an endless leather belt which runs on two rollers about 8 in. in diameter. The model is supported so that the wheels of the model are at the proper distance from the belt and measurement on the force of the model are made

when the belt is running at the same speed in the air. The belt itself is driven by an electrical motor placed outside the tunnel with a shaft driving one of the rollers. The belt in use is 78 in. long and about 12 in. in width. This apparently simple problem took over four months of development work with a number of cut and try adjustments for the correct tautness of the belt, shape of the rollers, adjustments of distance between rollers, avoidance of crowning, etc.

It is very satisfactory to be able to report that a model has been run up to speeds of 70 miles an hour with no flapping or crowning with the surface of the belt lying absolutely flat longitudinally or vertically. The apparatus of the belt is illustrated in the attached two photographs.

Experimentation with this apparatus has not been extensive enough to lay down results in general.

It may be said, however, that the results obtained so far with the belt bear out the following general theory.

1. Absolutely free air resistance is apt to be unduly high.
2. The mirror method approaches the correct results more closely, but may deviate in either direction from the correct results.
3. The fixed ground board owing to the boundary layer formation gives results which are far too low.

It is hoped that the use of this apparatus will at least establish a valid system of measurements and end long controversies.

JUST AMONG OURSELVES

A Fair Practice Code For Advertising

MAJOR B. H. NAMM of Namm's department store, Brooklyn, who has devoted much time in recent years to the truth-in-advertising movement, in a recent letter to *Advertising & Selling* says that more than enforcement of the retail automobile code is going to be necessary "if we are to make the buying and selling of automobiles 100 per cent honest, as it should be, for the benefit of all." The code permits advertising claims which, in his opinion, are unworthy of the high standards of the industry and "typical of that kind of advertising which has stirred up considerable consumer resentment."

He picks examples from current advertising which he says either are hard to believe, unfair to competitors, or which claim a supremacy also claimed by another company. Obviously, he points out, no two claims of the latter type can possibly be true. His examples are well chosen to illustrate his points; they would be easy for anybody to find. The existence of such claims must be admitted by anybody who reads automobile advertising.

Major Namm's remedy would be the adoption of a single fair practice code to govern all advertising (for he says the automobile makers are no worse than anyone else)—and incorporation of this code as a part of all NRA codes. Enforcement, he thinks, can come only through refusal of advertising media—backed by the Better Business Bureau—to accept advertising violating such a code.

Personally we should be more inclined to criticize the type of copy mentioned by Major Namm

on the score of ineffectiveness than on that of misleading the public. Exaggeration in American advertising has been so common for so long that it is hard to conceive the existence of large bodies of people so naive as to believe implicitly the most didactic of the claims.

To ask for scientific proof of all claims seems to us to be impractical. We can readily imagine several volumes of briefs being written, for instance, in controversy of Chevrolet's claim that "A Six Costs Less to Run" and Ford's "Less Cost to Operate—Ford V-8." And when the briefs had all been filed, the answer conceivably might be "So what?"

And as to hoping that the advertising media would effectively police a code of fair practice—that is likely to happen at the same time that the sands of the song-famed desert grow cold.

A code of fair practice for advertising might help matters through making readily available an agreed-upon basis for judgment, but we still feel that the problem requires a betterment in intelligence and effectiveness among the advertisers rather than in morals or ethics.

* * *

Code Rigidities Will "Unlax"

THE current confusion of prices and "new" models is a natural outcome of the code-made rigidities of certain parts of the car merchandising structure, as we mentioned several weeks ago. As expected the situation becomes less clear as the weeks roll on, so far as the public is concerned.

Few if any manufacturing executives realize fully how difficult it is to convey a single idea

clearly into the public mind. When even the slightest explaining is necessary, the impression in Mr. Public's mind is simply a blur. Ask the average automobile prospect even to distinguish clearly between the regular standard models of a given make which have been continued and advertised consistently for years and see how indistinct are his impressions.

Rapid model and price changes are almost certain from now on. Eventually, however, the confusion in the public mind will turn to indifference—and "eventually" may be months rather than years. The public has always been interested in automobiles, but it is not interested enough to spend much time trying to keep up with complicated changes in prices and models. The problem of effective advertising will be complicated definitely by the present trend.

All of which makes more straws in the wind pointing to modification or revision of current retail code provisions, resulting in a turning of the neck at least—if not the face—back toward greater freedom of action in merchandising for individual retailers.

* * *

An Innovation in Safety Campaigning

OUT in Cincinnati a police automobile equipped with a public-address loud speaking system is cruising about town bellowing admonitions to car drivers and pedestrians discovered in the act of violating traffic rules or the principles of traffic safety laid down by good sense and common custom.

The test of this new traffic-safety device is still in its experimental stages, but the chief of police has stated his belief that "if we drive this car around the city for a few days it will do wonders in stopping traffic violations."

All we can say is that hearing about it has reborn our childhood ambition to be a policeman. Wouldn't it be worth a week's pay anytime to have that car at your disposal for a day!—N.G.S.

New Model Introduction Expected to Begin Until N

THE automotive industry as a whole is definitely in its clean-up period at present, particularly from a manufacturing point of view. Since about the middle of July there has been a definite trend away from gearing production to sales in the direction of producing only for balancing stocks of cars in such dealer points as require additional models for virtually immediate delivery.

This would normally seem to indicate relatively early introduction of new models, but in view of the adequate stocks of new cars on hand at present that situation is not expected to develop. New models, according to present indications, will not make their appearance in any considerable number before the first of November.

By this of course is meant the type of "new model" which really incorporates major changes over 1934 series, and not so-called "new models" introduced mainly for clean-up purposes, showing but little if any change over previous lines. Such "new models" are becoming quite popular this year as a means of getting around the retail code by permitting factories to attach the designation of "obsolete" to previous cars in dealers' hands, which cars can then be sold at a discount.

There are other indications that the new model season is still some time off. Steel buying generally anticipates introduction time by about 60 days. Steel buying by the industry which reached and maintained high volume prior and up to June 30 has dropped off sharply since then. About the middle of July, the industry had enough steel on hand for

approximately 45 days production, bringing it up to September first.

Since that time purchases of steel have been almost entirely of a "spot" character, to balance steel stocks, where shortages or certain sizes or specifications were in prospect. In the past week or so buying has been slightly better than the low point reached the middle of July and shortly thereafter, but again it has been of a hand to mouth character.

Obviously the industry cannot continue indefinitely along these lines, and about the middle or end of September further buying should be in prospect. Whether or not it materializes seems to depend at present on the rather good prospect for a fairly long shut-down of a considerable number of automotive plants to permit dealers to clean up stocks.

A third indication of when new model production is about to get under way is of course machine tool buying. Today there is quite a little activity already among machine tool builders, but most of it is of the order of furnishing quotations for consideration by management.

Some work has of course already been released. Pontiac and Packard are both engaged already in re-vamping machine tool equipment for introduction of new models. In the case of Pontiac much of the outside work is in the line of reconditioning and retooling existing equipment for 1935 models, although new purchases are also being made and additional machine tools are being considered for purchase.

Such purchases as are being made by Packard at present are virtually entirely for production of the regular Packard lines, 1935 editions. These models should make their appearance around the first of September if normal indicators can be relied upon.

Pontiac should be the next one to introduce new models, but date of introduction may depend largely on present clean-ups. Apparently introduction time has been delayed somewhat, since Pontiac stepped up its production schedule for both July and August over original anticipations.

It should be mentioned here that in the case of Packard no actual new machine tool purchases for the lower priced car are being released, as yet. While a considerable amount may be required when final plans are okayed, the types of machine tools to be included will depend largely on completed studies of production costs, based on equipment at hand, reconditioned, and tools purchased outside. That stage is at least another 30 days away, and it may be two months or more, as a matter of fact before any actual releases come through.

Aside from the above there is little in the way of new models in immediate prospect. Good sales this summer have been of course a major factor in delaying new model introduction. Neither Plymouth nor Chevrolet have shown major signs of purchasing activities for 1935 as yet. Ford seems to be a little farther along

and requests for quotations have been going out in fairly good quantities. Apparently Ford is aiming at having machine tool equipment in operating condition by October first, which would seem to indicate new model introduction around or shortly after early November.

What Ford's plans are, is of course always somewhat of a conjecture. At the present time inquiries from machine tool buyers and parts suppliers would indicate that little change is contemplated in the power-plant but that bodies and chassis

by Athel F. Denham

Detroit Editor, Automotive Industries

Season Not November

would be materially revised or re-designed. Going down into the class of rumors, a report has it that Ford next year may abandon his relatively costly brake design and adopt brakes furnished by an outside supplier. Bendix, Budd and Kelsey are mentioned as possible sources of supply in the report.

Body changes of radical qualities can be said at the present time to be the only sure thing for 1935. What is going to be done to cars mechanically is still a moot question. Apparently major car producers are on the fence waiting to see what competition is planning.

Automatic transmissions at present don't seem to be in the cards for 1935, although anything may happen yet. One truck manufacturer is reported to have taken a license to produce an automatic transmission for trucks, buses and taxicabs, but that is as far as this idea seems to have gone in the industry.

As the result of this uncertainty as to mechanical changes required, only individualized chassis and powerplant parts have been okayed for tooling, resulting in a highly scattered character of requests for tooling quotations from machine tool builders. The amount of such requests is gradually rising from week to week however.

Body die work on the other hand has reached a much higher level of activity. Fisher Body is currently reported to be working full time on advance die work for 1935 models. It must be remembered, however, that even in the case of General Motors only a small percentage of die work relatively is handled within the corporation, most of it going to outside shops.

Another characteristic of this year's body die work is that a fair percentage is reported as already going and more is reported as slated to go to tool and die shops outside of the Detroit area. This seems to be largely a precautionary measure

on the part of manufacturers with the idea in mind, of course, of avoiding any possibility of a tie-up of new model introduction by a repetition of last year's labor difficulties.

Whatever chance of labor disturbances there seem to be are in the direction of possible A. F. of L. agitation at parts plants, on which organization has been concentrated by the Federation, with the realization that little can be hoped for at the automobile plants proper with their relatively high wages. The pat-

tern makers' strike in tool and die jobbing shops on Wednesday of this week, of course, constitutes a new factor whose potentialities can not be measured as yet.

Referring back again to tool and die work, Detroit shops, as a matter of fact, have in some instances already enough work at hand to keep them busy for several months. This work, as we have mentioned, is almost entirely in the nature of large drawing and stamping dies for bodies and sheet metal.

As a matter of fact, some of the Detroit shops are at present engaged even on production of body dies for automotive companies outside of the Detroit area, with Nash being among the companies having sent such work into Detroit.

Annual SAE Production Meeting Program

Book-Cadillac Hotel, Detroit, October 10-11, 1934

WEDNESDAY, OCT. 10—AFTERNOON

Cutting Oil Session—A. Ludlow Clayden, chairman.

"Cutting Lubricants and the Fundamental Characteristics in Their Selection," by W. D. Huffman, chief chemist, Chevrolet—Forge, Detroit.

EVENING

Dynamic Balancing Session—W. H. McCoy, vice-president, chairman.

"Dynamic Balancing of Rotating Parts," by Thomas C. VanDergrift, G-M Research Laboratory.

THURSDAY, OCT. 11—AFTERNOON

Broaching Practice Session—Joseph Geschlin, Engineering Editor, *Automotive Industries*, committee chairman and session chairman.

Papers—(a) "Survey of External Broaching Practice," by E. S. Chapman, Chrysler Corp., Detroit. (b) "Study of Costs with Respect to Purchasing Production Equipment," by J. E. Padgett, Spicer Mfg. Corp., Toledo.

EVENING

Production dinner sponsored by Detroit S.A.E. section. Speaker to be announced.

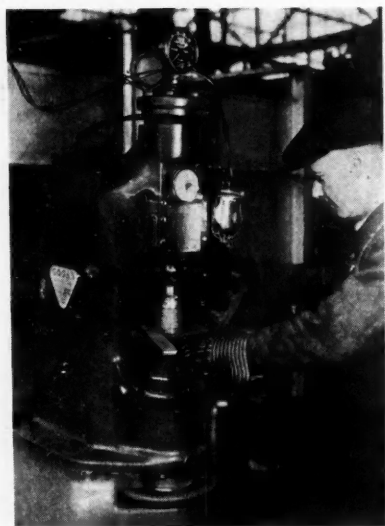
Machining Economies Result of Close Control in Dodge Annealing Furnace

TO attain precise metallurgical control in annealing, a gas-fired furnace has been designed and built at the plant of Dodge Brothers in Detroit, which is so closely controlled that there is no perceptible variation in the product annealed. In addition to obtaining the best in fine finishes, machining costs were reduced materially due to the uniformity of product.

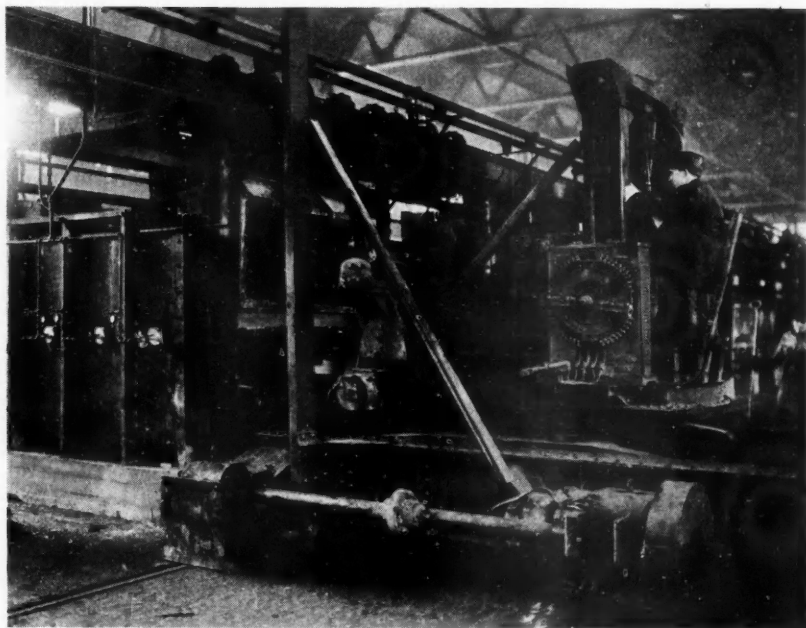
The new furnace is located in the old heat treat division, once known as the greatest electrical heat treating set-up, but which has since been changed over to gas fuel. It is designed to give a normalized anneal that will produce a specified laminar pearlite structure without variation. Treated gears are frequently checked as to this grain structure under the microscope.

The work is loaded onto alloy steel trays which are pushed through the furnace on its rails and rollers. When discharged the trays are returned to the charging end by a pneumatic hoist with "ice tongs" riding on an overhead rail parallel to the furnace. The novel feature about this new furnace is the fact that it is divided into five zones or chambers with separate temperature controls, arranged as follows:

The first heating and holding chamber is equipped with 16 gas burners, 8 to a side, half of which underfire the hearth while the others fire tangentially



Heat treated parts are tested regularly for hardness on a direct reading Brinell Machine



Close-up of automatic charger depositing 1200 lb. of forgings in one of the battery of 32 new gas-fired furnaces recently installed in Dodge Brothers heat treat department

to the arch. These are high pressure burners manifolded and controlled in two zones by two motors operated valves and two potentiometer type controllers with recorders. Pressure air for combustion is supplied by a blower.

The first cooling zone is designed to drop the temperature 325 degrees and is provided with cooling flues built in the floor and side walls and cold air is forced in by a blower to speed up the cooling. With this construction the atmosphere within the furnace is undisturbed. Openings between the arches are covered and sealed with cast nickel chrome alloy plates, the purpose being to transfer heat by radiation.

The second holding zone or chamber has 8 gas burners, 4 on each side, underfiring the hearth. These also are manifolded and controlled in two zones just as were the burners in the first section of the furnace.

The second cooling zone or chamber has dampered vents built into the side walls. The third cooling zone also has the dampered vents in the side walls and in addition a perforated arch, the openings of which are covered as were those in the first cooling zone.

Gear blanks treated in this furnace

are forged from S.A.E. 6150 steel of the following analysis:

Carbon	.45	—	.55
Manganese	.50	—	.80
Chromium	.80	—	1.10
Vanadium	.15	—	.18
Phosphorus (max.)	.04		
Sulphur (max.)	.04		

They are heated to 1650 deg. F. in the heating zone and held at this temperature in the first holding zone, the pusher being so timed that the gear blanks take about 2¼ hours to pass through both zones. From here they pass into the first cooling zone where their temperature is lowered to 1325 deg. F. in about 1¼ hours and then into the second holding zone where this temperature is maintained over a period of approximately 2½ hours travel. A drop to 1250 deg. F. is accomplished in the next hour and to 700 deg. F. in the hour following that, this last being the temperature at which the work is discharged. The total time in the furnace is 9 hours. After cutting the teeth and finish machining, the gears are quenched at 1475 deg. F. and drawn at 300 deg. F., which leaves them with a 72-78 scleroscope hardness. J. G.

The Forum—

Carbon Monoxide and Automobiles

Editor: AUTOMOTIVE INDUSTRIES:

The badly run automobile belches out a dangerous gas which poisons the air and, even when very dilute, may poison occupants. A correctly run engine not only saves cost but it reduces, to a minimum, the amount of poisonous gas discharged. There are thus great engineering and hygienic problems to be solved. Many minds have given much time to the improvement of combustion, but its hygienic aspects also need more intensive study. A mere knowledge of engineering is hardly sufficient to enable a proper solution of this particular aspect of hygiene.

The need for improvement of automobile operation as regards health is coming every day to be more and more important. As cars increase, so does the menace of carbon monoxide poisoning increase. Unexplained cases of loss of control, sometimes ascribed to alcohol, may really be due to persistent absorption of small quantities of the gas, and there must be some radical departure in design so that the carbon monoxide hazard may be reduced.

It would seem ridiculous for an outsider to offer engine designers any suggestions as to how safety may be accomplished or what may be done to reach this consummation, but it is certain that one improvement ought to be made. There should be an indicator on the instrument board recording engine efficiency, perhaps by showing the amount of carbon monoxide gas in the exhaust.

Other mechanical improvements suggest themselves, such as, for instance, prevention of seepage between a defective exhaust pipe and the interior of the car by means of impervious floors. Then there is the possibility of having a vertical, instead of a horizontal, exhaust, so that carbon monoxide may be discharged higher than the breathing level. However, the subject is complicated. Automobiles in the open air have to be considered from one

aspect, while those in garages present an entirely different problem.

Dangerous as is carbon monoxide even in small quantities to the driver of a car, it is much more of a hazard in warming up engines in the morning, often in a closed garage when the exterior temperature is low. The danger is enormously increased where batteries of buses have to be warmed up before operation. Here, of course, the vertical exhaust would be of small help, and an alternative is either to provide ample ventilation or to carry the exhaust directly to the outside by means of a flexible hose and vents. The Division of Industrial Hygiene of the New York State Department of Labor suggests the use of a detachable vertical exhaust while machines are being run in a garage, pending the adoption of a vertical exhaust pipe.

The elimination of the carbon monoxide hazard may be reduced to two propositions: first, the altera-

tion of car design so as to make a vertical exhaust pipe an integral portion of the car; secondly, in garage operation, pending this change, to have a detachable one—and to use it. In any case, in garages and service stations ventilation by artificial means is desirable.

The problem is large; it has many ramifications. Many interests are involved, yet the basic improvement that can be made in the prevention of carbon monoxide in automobile operation must begin with automobile design, and this beneficent change is in the hands of a few. That is to say, the automobile manufacturers must adopt the principle of "integral hygiene" if the factor of poisoning by carbon monoxide is to be coped with. This might be regarded by a competent engineer as really a minor problem, yet one could issue a guarantee to the man who adopts this suggestion that perhaps hundreds of lives a year would be saved. Surely, this goal is worth aiming for.

J. D. HACKETT,
Director.

Division of Industrial Hygiene, New
York State Department of Labor.

Slonneger Method Combustion Analysis

Editor: AUTOMOTIVE INDUSTRIES:

The Slonneger method of combustion analysis by indicator diagram is so simple and obviates so many errors in the assumptions necessary with the theoretical analysis, as to possess real practical utility. It is therefore believed that the confusing relation between the initial assumptions and the final conclusions, in the article on pages 778-779 of the issue of June 23, should be definitely cleared up.

The confusion arises from three omissions in the explanation of the method, without which its results are apt to be grossly misinterpreted.

The first omission neglects the fact that fully one-third the heat of combustion is lost to the cooling water, and one-half to two-thirds of

this cooling loss occurs during the combustion period. This is due primarily to the fact that the radiation loss to the cold metal walls varies as the fourth power of the absolute charge temperature. From 16 to 22 per cent of the total heat of combustion therefore is lost before it can add to the heat supply to the charge. This indicator diagram method of analysis must therefore be rigorously interpreted as showing the cycle-history of the heat-addition to the charge, not the history of the combustion. The statement that the "Percentage of effective combustion evidently is the same as percentage of total heat added to the expanding gases in the course of combustion" is therefore apt to be confusing. The statement "At

point E, where the expansion line reaches the greatest distance above the fourth polytropic curve, supply of heat to the charge ceases *and combustion therefore is complete*" is also apt to be confusing. At this point E the supply of heat first becomes equal to the cooling-loss.

The second omission neglects the partial combustion stoppage as the flaming charge reaches dissociation temperatures. Once this temperature zone is reached, explosive combustion ceases, and a slow isothermal combustion is maintained regardless of the rate of mixture of white-hot fuel oxygen particles. These facts do not affect the correctness of the method, but dominate the interpretation of the diagrams in the high-temperature zone.

The third omission confuses the explanation by neglecting to clearly state the fact that the heat input "to increase the pressure from one polytropic curve to the next is always the same," only when the cylinder volume is constant, i.e., at constant crank angle in Fig. 1. Since this point is fundamental to the whole analysis, it will be illustrated by an

example. At point B the absolute temp. is approx. 1200 deg. F. To move vertically from point B on the first polytropic to point B on the second polytropic, the absolute temperature must be doubled, requiring a 1200 deg. temp. rise. At say 120 deg. crank angle, the absolute temp. on the first polytropic is 600 deg. F., and only 600 deg. temp. rise is required to reach the second polytropic at this crank angle. Differences in specific heats being here negligible, it evidently requires twice as much heat-input to move from the first to the second polytropic at zero degs. crank angle as at 120 degs. Therefore the polytropic curves are not curves of constant percentage heat-input, either in general or in any particular case. The statement "the fourth polytropic represent 94 per cent of effective combustion, the third 62 $\frac{2}{3}$ per cent," etc., is confusing not only in the use of the term "effective combustion" instead of "total charge heat input," but in the lack of any strict logical basis for such a conclusion. The writer states that "these figures are obtained by simple proportion."

Actually, it is the usual practice in thermodynamic analysis, to determine pressure volume and work relations from the indicator diagram, and to study heat-input relations from a temperature-entropy diagram. The plotting of an entropy diagram from the indicator card is more laborious and requires more than mere drafting skill, but is theoretically correct and universally applicable.

The indicator-diagram heat-input analysis by the Slonneger and other purely empirical methods, is much quicker and simpler, and in usual cases shows results, when correctly interpreted, sufficiently accurate for rough comparisons.

The quoted article is chiefly confusing because it attempts to establish a rigorous theoretical proof for a purely empirical and approximate method. It is quite impossible to quantitatively determine heat-input relations from a pressure-volume diagram, by the Slonneger or any other method neglecting the entropy factor.

ROBERT E. BRUCKNER.

Chrysler Steering Knuckle Forged at Century of Progress

AN interesting feature of the Chrysler steering knuckle being produced at the World's Fair on a 4000 lb. steam drop forge hammer is pointed out by the Erie Foundry Co.

From the technical standpoint interest centers in the design of the dies. Spindles are usually drop forged with the center line of the spindle lying in the parting line between the top and bottom dies. This, however, necessitates draft on the flange, on the wide face between the two bosses. The draft must be removed by a separate forging operation in an upsetter or in a press, or else it must be machined off. Another disadvantage is that the spindle cannot be designed like the one illustrated, but must be modified by adding weights and metal between the two small lugs which extend from the bottom boss. Otherwise the forging would be undercut at those points and could not be made.

In the present case the dies are made with the parting line running around the edge of the flange so that the dies are interlocked, and the



Unusual forging technique used in production of Chrysler steering knuckles

forging is gated at one edge of the flange. This would involve nothing unusual if it were not for the fact that in order to provide the necessary "toe-in" to the wheels, the center line of the spindle is not at right angles to the center line drawn through the two bosses.

The forging is made from alloy

steel bars 3 in. x 1 $\frac{1}{2}$ in. in cross section cut into 6-in. lengths. Blanks are heated in a gas-fired furnace arranged for automatic temperature control, to a temperature of 2210 deg. F. The first operation is to draw out a taper at one end of this bar. For this drawing out operation a light quick blow is required and the hammer must be under perfect control to strike blows at just the right force and at such a rapid rate that there is no opportunity for the metal to cool down. This drawn out tapered part is then placed almost vertically, in another impression in the bottom die, and the section at the other end of the blank is flattened out, and in subsequent operations forged to the desired shape. During these operations the forging remains in the bottom die, while the top die leaves the forging at each stroke, the usual draft being provided on the ends of the bosses. The forging having been finished, it is removed from the bottom die, not vertically but at a slight angle from the vertical corresponding to the "toe-in" angle of the spindle.



Row of 25 cars in Chevrolet conditioning plant nearly ready for the road test. Cars OK'd by the test driver are delivered to the shipping platform

PRODUCTION LINES

Labor's Moves

If you would follow what the other half thinks, see the "American Federationist," official organ of the A. F. of L. for July. The issue is devoted to reports of the activity and organization of Federal Labor Unions in the leading plants of the automotive industry. Objectives, problems and attitude of management in each plant are minutely discussed. That automotive manufacturers, in general, are complying with the Code and paying higher than Code wages seems to be an almost universal experience. It is evident that certain "company unions" have a strong hold on the workers. And there is a general note of exasperation leveled at the "dumb" workers who feel that the company union is a good thing. Space permits only a passing reference to the concerted movement on the part of the A. F. of L. It will pay management to study this interesting document.

Remote Control

Here is a gadget to complement the radio control from the rear seat. And comfort the back seat driver. It seems that down in the blue grass state, a husband persists in driving without benefit of the horn. This upset his wife and caused severe mental anguish, naturally. So now the car is equipped with remote control of horn—permitting the quarterback to call signals at will. This may become a popular accessory (?)

Research Micros

Bausch & Lomb, builders of scientific instruments extraordinary, has issued a bulletin describing a line of research microscopes with acces-

sories. Not the least important of the attachments is equipment for micro-manipulation which supplies a means for movement in three directions. It permits the handling of minute objects or cells.

Souvenir

As a collector of such things, we are rather pleased with the little packet of raw materials specimens put out by Ford for distribution at the Fair. It's a little package but it contains 12 specimens of ore and other raw materials with explanatory notes. Your small boy will be inetrsted—maybe you will be too.

To Identify

Dill is out with a new line of metal serials and stencils of tin and aluminum. These are widely used to identify automotive products of every description. Characters are raised or depressed as you wish. Complete line is described in a catalog just off the press.

Better Wiring

Comes a letter from one who has spent many years on the electrical systems of automobiles. It was prompted by our recent articles on the requirements of adequate electrical systems. Our correspondent claims that much of the wiring is badly done. "Why," he asks, "don't we use better fittings, comparable to good house wiring practice?" Incidentally, he has been able to improve the electrical system of many individual cars of different makes by using wire several gages heavier; also by using a more expensive cable, well insulated. We must confess that we haven't given this matter

much attention. What say ye who have a first-hand knowledge of the facts?

Steel-Strong

Brastil, a copper alloy with more than 81 per cent copper, said to have the strength of steel, is announced by Doehler. This pioneer in the field of die casting finally has perfected an alloy that should be of intense interest to automotive designers. Complete details will be found in a little bulletin just off the press. Shall we get you a copy?

Light Pointer

Maybe you have used this device. At a recent technical meeting the speakers used a very effective pointer in explaining slides that were thrown upon a somewhat distant screen. The pointer was an ordinary flashlight arranged to throw a slit of light. Might be a good thing for most technical meetings and certainly less wear and tear on the speaker.

Poison Bath

Every Nash transmission gear is given a "poison bath" by immersion in molten potassium cyanide. It is claimed that this simple treatment removes all scale after heat treatment, in addition to producing the surface hardening which naturally results.

Monel Skis

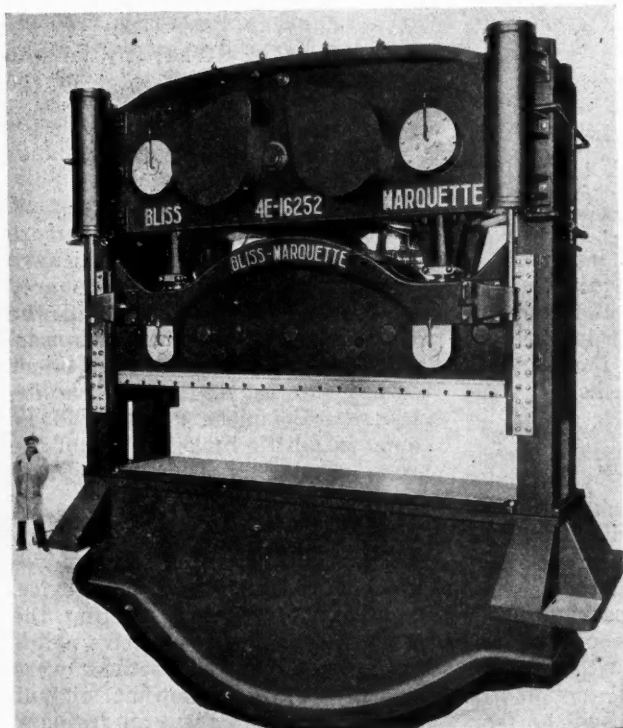
Because of their strength, resistance to wear and abrasion, and immunity to rust, Monel Metal aeroplane skis are being used for winter flying by foresters of the Ontario Department of Lands and Forests.

—J. G.



NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools



Bliss Builds Largest Press

One of two interesting power presses built at the Toledo plant of the E. W. Bliss Company is shown here. Both are of steel plate construction fabricated by welding. One of them is the largest press ever built in this way. Both are of novel design with short shafts running front to back, eliminating torsional strains and connection back thrust against the frame.

The press shown is of the four-point type, with connections at the four corners of the slide, adapting it to widely unbalanced loading. It has 16-in. shafts in shear and is rated for a working capacity of 1800 tons plus 300 tons for the drawing cushions. It is 252 in. wide, between housings, and the bed is 68 in. front to back, while the slide face measures 241 in. by 52 in. The stroke of the slide is 16 in. and the speed seven strokes per minute. The weight, complete, was about 750,000 lb. The welding was done by Westinghouse Electric and Manufacturing Co. with Carnegie welding quality plate. The press is used for forming two automobile frame side rails per stroke from 5/32-in. steel blanks, or one truck side rail from 1/4-in. stock.

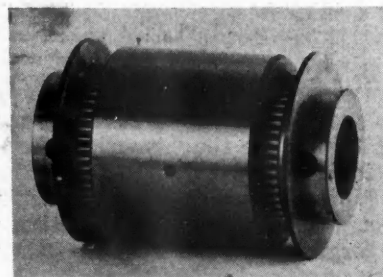
The other press is a double eccentric machine of the new front to back shaft type. It has a rating of 1200 tons, a stroke of 18 in., at 10 strokes per minute. The slide is fitted with right and left cross-bar knockouts which are air-counterbalanced. The bed area is 50 in. by 148 in. Welded members were fabricated by Lukenweld, Division of Lukens Steel Company.

Both presses are equipped with Marquette Tool and Mfg. Company (Toledo), hydro-pneumatic drawing cush-

ions in the beds with automatically timed locking devices.

Bantam Quill Bearings for Aircraft

Bantam quill bearings have found application in the control mechanisms of aircraft. The new Vultee Transports that are being built for American Air Lines are said to be the first ships having anti-friction bearings in all important control locations. These bearings are used also at the bearing points of the tail wheel assembly and in the transmission line which operates the wing flaps and the retractable landing gear.



Bantam quill bearing

A capacity of
1800 tons plus
300 tons for the
drawing cushions

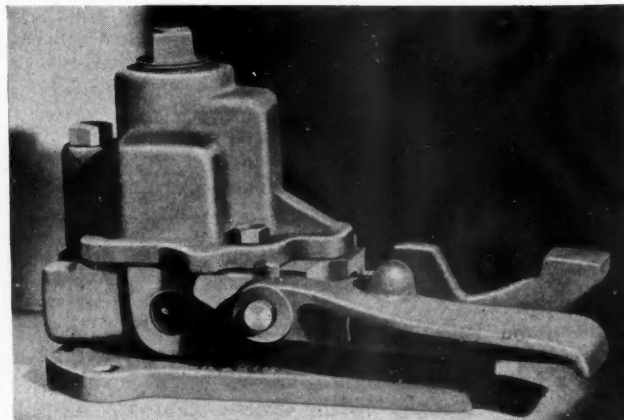
Hydraulic Control by Foot Valve

Hanna Engineering Works, Chicago, Ill., has introduced a spool-type, foot-operated hydraulic valve, the principal moving part being a spool or piston, fluid balanced in all directions. The fluid pressure does not affect movement of the spool either by force or friction.

The valve is for either three-way or four-way distribution. The spool moves but 7/16 in. for a full reversal of fluid distribution and the pedal for foot operation moves through an angle of but 10 degrees. The operator's toe need be raised but 2 1/2 in. above the floor. A latch is combined with the pedal to hold it down until unlatched by foot, whereupon the pedal is raised by spring to starting position.

The base plate is large so the valve

New Hanna valve
adapted to re-
mote control



will not tip when foot-operated, even though no floor bolts are used in the base plate holes provided for them. Thus when the valve is connected to the cylinder it controls and to the fluid supply by hoses it may be moved about on the floor until the most desirable permanent location is found.

This valve is said to be well-suited for actuation automatically by the cylinder unit it controls because a short movement and a very light force is required. This also makes it adaptable for solenoid or other types of remote control. When so actuated, a short lever, which moves only 5/16 in. at its outer end, takes the place of the pedal on the pedal shaft.

NEW DEVELOPMENTS

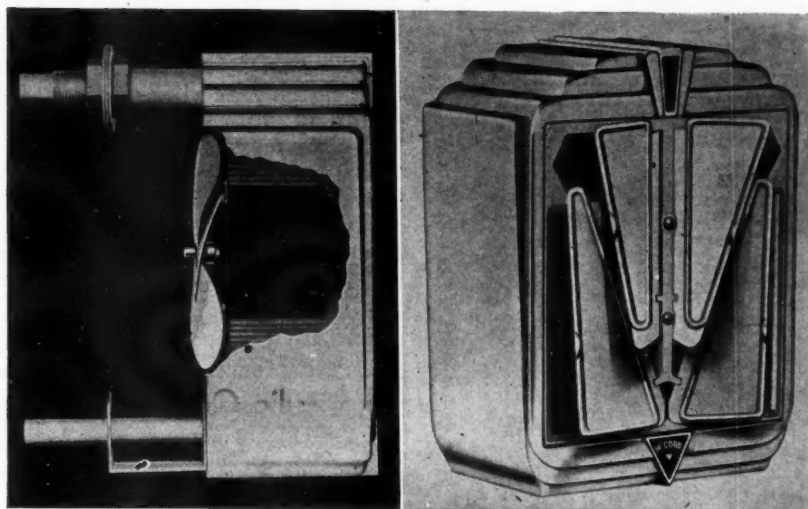
Automotive Parts, Accessories and Production Tools

Line of Small Electric Brakes

A line of small A.C. and D.C. solenoid-operated brakes is announced by

A.C. or D.C. brake as needed. Brake shoes use molded brake lining and provide 180 degrees braking service.

These new brakes are intended for applications on machine tools, conveyors, small hoists, etc.



Sectioned side view and front view of McCord heater

New McCord Car Heaters Are Compact

A line of hot-water car heaters has been announced by the McCord Radiator & Mfg. Co. of Detroit. It comprises four models, the Master (No. 100), the Standard (No. 101), the Utility (No. 102), and the Service (No. 103), the prices of the four models being \$19.95, \$15.95, \$12.95 and \$7.95, respectively.

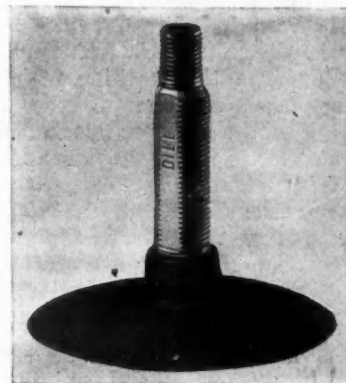
The Master and Standard models have a full-depth die-cast shell with a two-tone chromium-plate finish. The heaters are unusually compact, the largest projecting only 5½ in. from the dash. Heaters are supported at a single point. Other features include a flat-tube type of copper core, an adjustable deflector giving control of the heat distribution (the Service model comes with a fixed deflector), a motor mounted inside the core instead of in back thereof to conserve space, an illuminated rheostat type of switch on Master, Standard and Utility models and a toggle-type switch on the Service model, and hexagon openings in the upper part of the grille for attaching sleet pipes to direct hot air against the windshield to melt frost or snow.

Cutler-Hammer, Inc., Milwaukee, Wis. Three brake sizes are included with torque ratings ranging from 3 lb.-ft. to 75 lb.-ft. These torque ratings are in accordance with NEMA standards, conforming closely to the full load torque ratings of small standard motors.

Dimensions of the A.C. and D.C. brakes are interchangeable, so that machine designers can provide standard mounting holes and apply either the

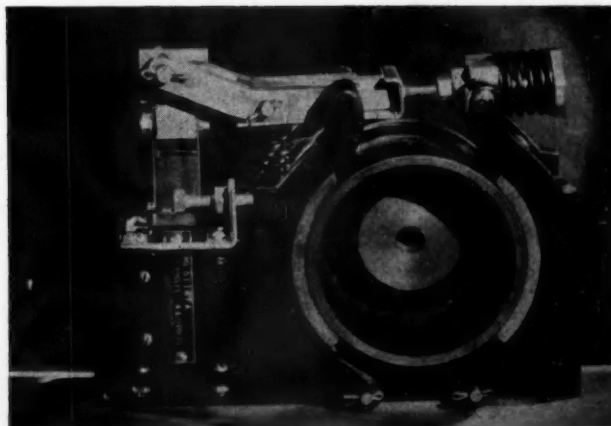
Valve Stem Integral Part of the Tube

A new tire-valve stem has been developed by the Dill Manufacturing Co. of Cleveland, Ohio. The base consists of rubber which is semi-vulcanized directly onto the metal stem, which in turn is fully vulcanized into an integral part of the inner tube at the time the tube is made. The result is said to be elimination of all possibility of leaks at the valve-stem base. The manufacturer claims that in this way the advantages of durability, rigidity and ap-

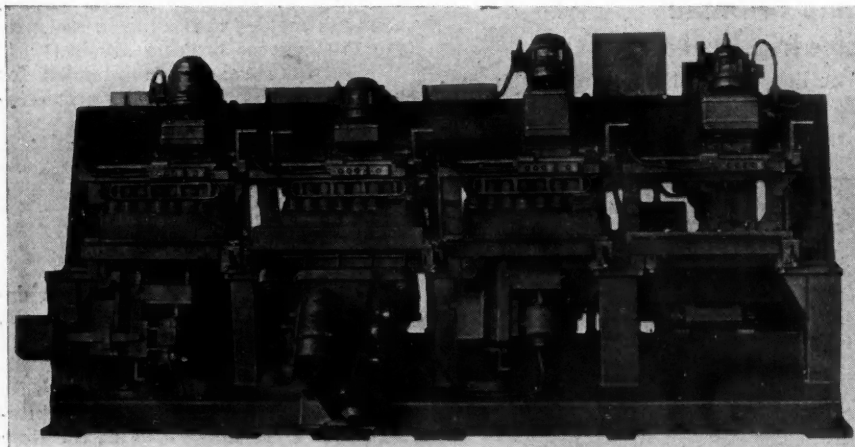


pearance of the metal stem are retained and the disadvantages of its application to the tube eliminated.

Cutler-Hammer small brakes



Drills and Taps All Angular Holes in a Straight-Eight Cylinder Block



A MACHINE to drill, chamfer, ream and tap all the angular holes in the cylinder block has recently been built by Greenlee Bros. & Co., Rockford, Ill. The photograph shows the machine which is being used on one of the new straight-eight cylinder blocks.

The block enters the machine at the left end, station No. 1, with the bottom face down and the distributor side to the rear. It is transferred manually from one station to the next after each operation and leaves the machine at the right end with all angular drilling, chamfering, reaming and tapping operations completed.

Each station has its own independent locating and clamping mechanism, as well as independent feed, making each station a complete machine in itself.

All drilling and chamfering operations are performed in the first three stations and tapping operations in the fourth or last station. The operations performed in each station are as follows:

First Station

Drill (5) "S" (.348 dia.) oil holes through oil gallery to camshaft bearings, 3 in. deep.

Drill, counterbore and chamfer distributor hole.

Drill 1/2-in. hole from pump to oil gallery.

Second Station

Drill (5) 5/16-in. dia. oil holes

from crankshaft bearings to camshaft bearings.

Drill (1) "G" (.261 dia.) hole through distributor hole, 3 3/4 in. deep.

Drill (2) "G" (.261 dia.) holes in face of distributor boss.

Third Station

Drill (5) "S" (.348 dia.) oil holes to camshaft bearings from oil gallery.

Chamfer (2) "G" holes in face of distributor boss.

Semi-finish ream distributor hole.

Drill 17/64-in. dia. oil gage hole.

Chamfer (1) "G" hole on side of distributor boss.

Fourth Station

Tap (5) holes from oil gallery to camshaft bearing 1/8 P.T.

Tap (2) 5/16-18 holes in face of distributor boss.

Tap (1) 5/16-18 hole in side of distributor boss.

In each of the three drilling stations there is one Greenlee standard cam-feed unit which, through racks and pinions, feeds all other drill heads in that station. One of these units is shown in the lower front in the second station. The other two are in the rear view of the machine. All drill units are independently adjustable for depth of feed, but the total stroke of each rack-feed is dependent upon that of the cam-feed unit.

The feed in the first three stations is electrically controlled by a push button, operating in conjunction with a solenoid controlled clutch.

In the fourth station all tapping heads are independent of each other with regard to stroke, adjustment and control, each having screw feed and being driven by a reversing motor with a limit switch and push-button control.

This machine, of course, is subject to modification with reference to number of stations and operations to be performed. It can be adapted to other parts, too, where the size and shape provide for this method of handling.

Starting Torque of Diesel Engines

THE question of the starting torque required by high-speed Diesel engines has come up repeatedly during the past year. Some light was thrown on the subject in the course of a recent session of the Equipment Activity of the French Society of Automobile Engineers. M. Vadier, whose experience had been with an air starter on a Unic Diesel engine of the precombustion-chamber type with a displacement of 522 cu. in. and a compression ratio of 15 to 1, presented a curve showing that to assure ignition on the first injection requires a starting torque of 188 lb.-ft. at 140 deg. F., 216 lb.-ft. at 104 deg. F., 282 lb.-ft. at 68 deg. F., and 592 lb.-ft. at 32

deg. F. This makes slightly more than one lb.-ft. per cu. in. displacement at the freezing point.

Slightly lower figures were given by M. E. Petit, whose experience had been with electric starters. According to this authority, the starting torques per cu. in. of piston displacement under different temperature conditions are as follows:

0.59 lb.-ft. for a four-cylinder engine between 23 and 27 deg. F.

0.71 lb.-ft. for a six-cylinder engine between 23 and 27 deg. F.

0.71 lb.-ft. for a four-cylinder engine between 19 and 23 deg. F.

0.95 lb.-ft. for a six-cylinder engine between 19 and 23 deg. F.